Turkish Journal of Bioscience and Collections

Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

İSTANBUL UNIVERSITY PRESS

Turkish Journal of Bioscience and Collections **is the peer-reviewed journal.**

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Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

English Language Editors/Dil Editörleri
Alan James Newson, Istanbul University, Istanbul, Turkey
Elizabeth Mary Earl, Istanbul University, Istanbul, Turkey

Type of Publication/Yayın Türü
International Periodical/Yaygın Süreli Yayın

Language/Yayın Dili
English, Turkish/İngilizce, Türkçe

Publishing Period/Yayın Periyodu
Biannual (February & August)/Altı ayda bir Şubat ve Ağustos aylarında yayımlanır

Tarandığı Endeksler/Indexed by
CAB Abstracts - CABI
Global Health Database - CABI
Directory of Open Access Journals (DOAJ)

Publisher/Yayıncı
Istanbul University Press / İstanbul Üniversitesi Yayınevi
İstanbul Üniversitesi Merkez Kampüsü,
34452 Beyazıt, Fatih / İstanbul - Türkiye
Phone / Telefon: +90 (212) 440 00 00

Web
https://tjbc.istanbul.edu.tr
https://dergipark.org.tr/en/pub/tjbc

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RESEARCH ARTICLE

Catalogue of Sponges, Cnidarians, and Echinoderms From Brazil Based on a Historical Inventory of the Invertebrate Collection Paulo Young (CIPY)

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Received: 02.03.2020
Revision Requested: 03.04.2020
Last Revision Received: 15.04.2020
Accepted: 20.05.2020

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Citation: Gondim, A. I., Christoffersen, M. L., & Pereira-Dias, T. L. (2020). Catalogue of sponges, cnidarians, and echinoderms from brazil based on a historical inventory of the invertebrate Collection Paulo Young (CIPY). *Turkish Journal of Bioscience and Collections*, *4*(2), 30–63.

https://doi.org/10.26650/tjbc.20200099

Abstract

Scientific collections represent a highly relevant social legacy. They provide a source for research and production of human resources at several academic levels and play a key role for the preservation of biodiversity. The Invertebrate Collection Paulo Young (CIPY), held at the Universidade Federal da Paraíba (UFPB), contains one of the most complete collections of shallow water marine invertebrates from Northeastern Brazil. It contains about 18,000 catalogued samples, and circa 2-3 times more samples awaiting identification and registration. The samples were collected in a variety of natural and artificial marine environments (e. g., coastal reefs, mangroves, and shipwrecks). The main collection is subdivided into seven main groups (Porifera, Cnidaria, Mollusca, Annelida, Crustacea, Echinodermata, and Ascidiacea), and other smaller groups (Bryozoa, Echiura, Sipuncula, Pycnogonida, Enteropneusta, and marine Turbellaria). Using only identified and registered samples, we catalogued 285 species among the phyla Porifera (89 spp.), Cnidaria (93 spp.), and Echinodermata (103 spp.). The collection has 36 types of species (including three Porifera, one Cnidaria, and four Echinodermata). Considering its representativeness, this collection has a valuable record of Brazilian national marine diversity. Thus, the CIPY deserves to be known, recognized, and made available for study.

Keywords: Zoological collections, biodiversity, benthos, conservation, North-eastern Brazil

Introduction

Scientific collections have been a vital part of scientific knowledge for centuries. They play a crucial role in fields lying at the forefront of the biological sciences. These include the study of biodiversity and its losses, biological invasions, global climate change, and reconstructions of evolutionary patterns and processes (Shaffer *et al.*, 1998; Suarez & Tsutsui, 2004; Pyke & Ehrlich, 2010; Bi *et al.*, 2013; Gomes *et al.*, 2016). In Brazil, the Imperial Museum (later the Museu Nacional do Rio de Janeiro) held the first scientific collection in the country, founded in 1818. It appeared as an initiative of Emperor Dom João VI (Carvalho, 1988; Zaher & Young, 2003). But, only in the second half of the nineteenth century did an expansion of natural history museums occurr in the country (Possamai *in* Andrade, 2018). The XXth century has been considered the century of museums in Brazil (Chagas, 2009). Presently, the zoological collections of the country are basically concentrated in museums (e. g., the Museu Nacional do Rio de Janeiro - MNRJ, Museu Paraense Emílio Goeldi - MPEG, Museu de Zoologia da

Universidade de São Paulo – MZUSP), institutes (e. g., Instituto Butantan) and, mainly, in departments of public universities. This last category includes collections without the status of museums, and are usually associated with laboratories (Marinoni *et al.*, 1988).

The Invertebrate Collection Paulo Young (CIPY) was officially created in the 90s. Originally, it was known as the Collection of Marine Invertebrates. The origin of this collection, however, dates from the year 1977. It was organized in response to the demand of biology professors and students from the Departamento de Sistemática e Ecologia (DSE), at the Universidade Federal da Paraíba (UFPB) (João Pessoa, Paraíba State). During this period attempts to investigate and catalogue the biodiversity in Northeast Brazil were just starting. The first collections organized were those of Crustacea and Mollusca, by the researchers Dr Maria da Conceição Quintino Farias and Dr Maria Priscila Muniz Djick, respectively. Between 1981 and 1982, the CIPY was significantly increased, both in number of specimens and in diversity of taxa, as the result of a National Zoology Program – "Project Fauna", financed by the CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico), under the supervision of Dr Martin L. Christoffersen. During this project, marine macroinvertebrates were systematically collected along the beaches from the State of Maranhão to Bahia (01°02′N 18°20′S), including Abrolhos Archipelago (Bahia). As a result, the CIPY obtained the most representative faunal samples from North-eastern Brazil.

Since this foundation, several marine invertebrates have been constantly added to the collection, as a result of research projects developed by professors and students of the Universidade Federal da Paraíba. Other material has been obtained by donations from Brazilian researchers or in exchanges with other national and international institutions. This collection also houses material of selected zoological groups (e. g., Mollusca and Echinodermata) dredged by important oceanographical expeditions such as Geomar, Akaroa, and Project Algas-PB.

Despite its relevance, the CIPY was neglected for many years. Under the initiative of Dr Carmen Alonso Samiguel, its material was recovered and revitalized. After her retirement in 2012, the responsibility for curatorship returned to Dr M. L. Christoffersen. The name of the collection is an homage to Dr Paulo Secchin Young (MN/UFRJ), who significantly contributed to the expansion of the collection during the period in which he completed his Master's degree in the Programa de Pós-Graduação em Zoologia (PPGCB) of UFPB. The CIPY integrates the national CGEN (Conselho de Gestão do Patrimônio Genético/Proc. Nº02000.002852/2002-37). The collection has more than 18,000 registered samples and several samples 2-3 times larger awaiting identification and registration. The collection has seven main sub-collections (Porifera, Cnidaria, Mollusca, Annelida, Crustacea, Echinodermata, and Ascidiacea) and other smaller collections (Bryozoa, Echiura, Sipuncula, Pycnogonida, Enteropneusta, and marine Turbellaria). The collection houses mainly marine animals, but freshwater specimens of Porifera, Mollusca, Crustacea, and Annelida, and terrestrial specimens of the three latter groups are also represented. These units vary in geographic scope. There are collections with international, national, and regional coverage. The CIPY is a unique collection in the country, being the only one to have systematically surveyed the entire north-eastern region (from the north of Maranhão to the south of Bahia). This area represents 42.5% of the entire Brazilian littoral zone (Gondim *et al.*, 2014a). Currently, part of the collection is stored in mobile compact shelves in an air-conditioned room. The entire collection is organized according to the taxonomy of each zoological group. In addition, the collection is catalogued in Microsoft Excel spreadsheets and hosted in a cloud saved service.

Considering the importance of disclosing and expanding access to the material contained in the CIPY, we provide an annotated catalogue of the Porifera, Cnidaria, and Echinodermata deposited in this collection. We further discuss the main requirements and demands of Brazilian scientific collections in general. Additionally, we also provide a summary list of the types of species housed in the CIPY.

Material and Methods

The information used herein was obtained from consulting book logs, revising samples deposited in the CIPY, and from published information on the material in this collection (Gondim *et al.*, 2008, 2010, 2011, 2012, 2013a, b, c 2014a, b, 2015a, b, 2018a, b; Prata & Christoffersen, 2016, 2017; Prata *et al.*, 2014a, 2017, 2020; Santos & Pinheiro, 2013, 2016; Barros *et al.*, 2013). For each taxon we provide the state in which they were found (MA, Maranhão; PI, Piauí; CE, Ceará; RN, Rio Grande do Norte; PB, Paraíba; PE, Pernambuco; AL, Alagoas; SE, Sergipe; BA, Bahia. A few extralimital records are also indicated: PA, Pará, in Northern Brazil; and ES, Espírito Santo, RJ, Rio de Janeiro and SP, São Paulo, in the

Southeastern Region). In addition, voucher numbers, data on habitat, depth and ecological information contained in the field label were included.

The taxonomic list is organized systematically according to specialized literature and online resources, such as the Porifera Database (Van Soest *et al.*, 2020), World List of Scleractinia (Hoeksema & Cairns, 2020), World Register of Marine Species: WoRMS (2020), Asteroidea DataBase (Mah, 2020), World Echinoidea Database (Kroh & Mooi, 2020), and Ophiuroidea Database (Stöhr *et al.*, 2020).

Results

We catalogued three classes, 15 orders, 36 families, 48 genera, and 89 species of Porifera, four classes, 12

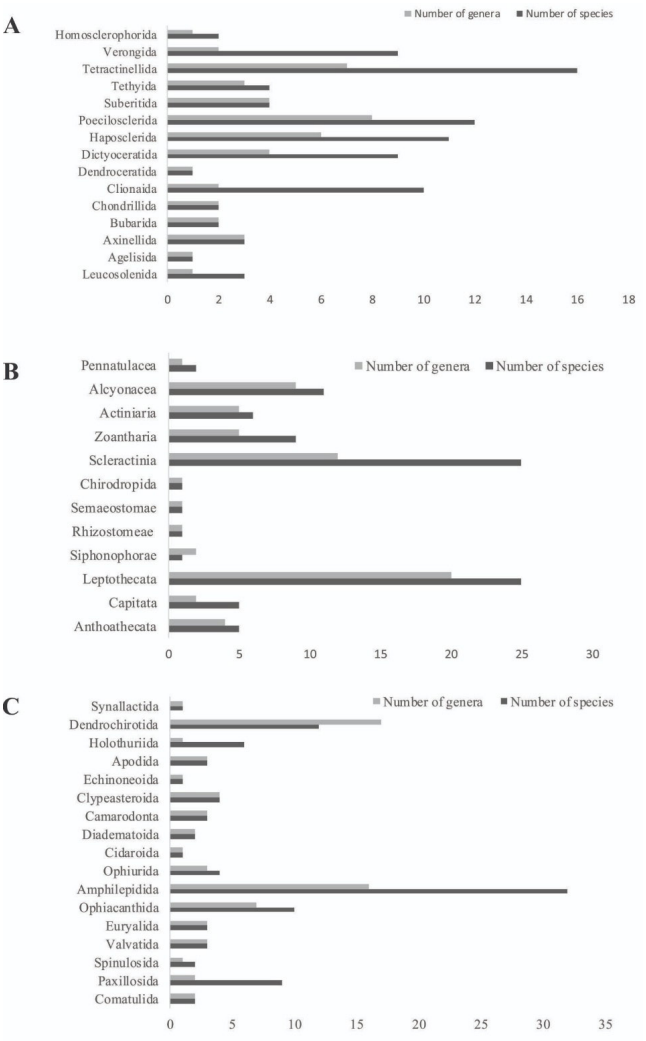

Figure 1. Number of species and genera of the different orders of the phyla Porifera, Cnidaria, and Echinodermata hosted at CIPY. (A) Porifera; (B) Cnidaria; (C) Echinodermata

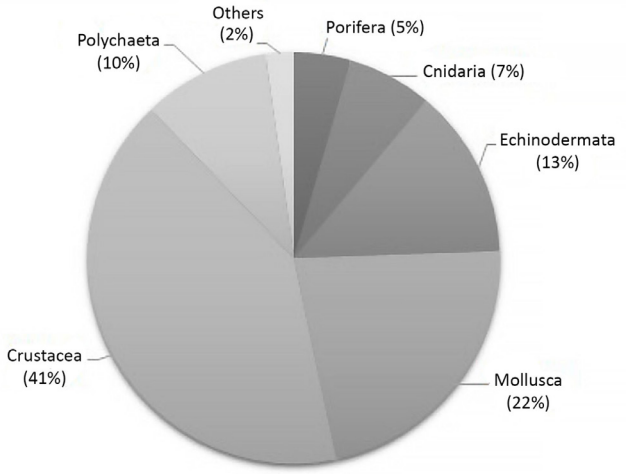

Figure 2. Representativeness of the specimens deposited in the collections in the Invertebrate Collection Paulo Young (CIPY) of the Universidade Federal da Paraíba (Brazil)

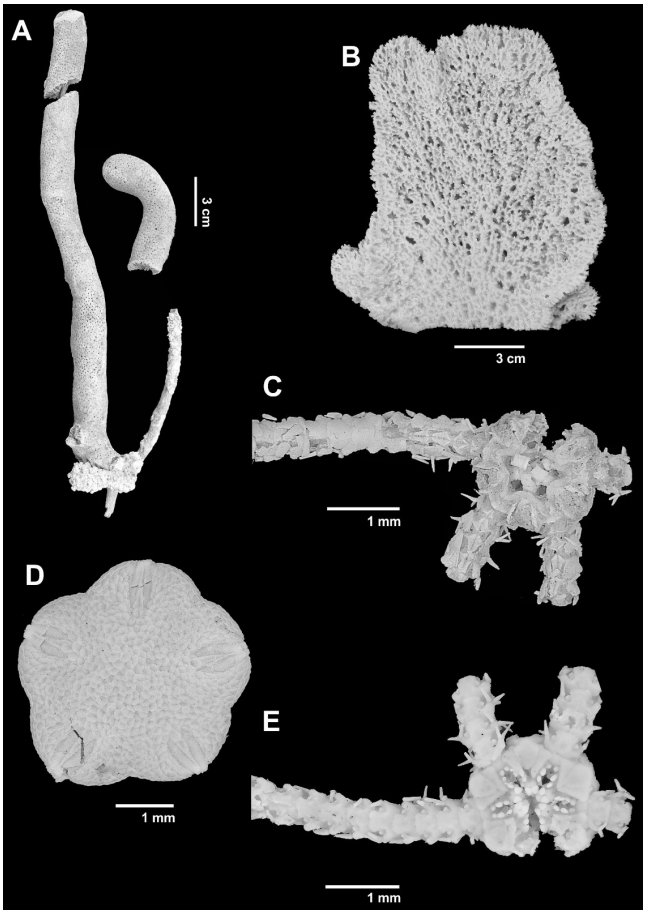

Figure 3. Some type specimens deposited in the CIPY, Universidade Federal da Paraíba (Brazil). (A) Paratype of *Plexaurella regia* (UFPB.CNID.279); (B) Paratype of *Clathria* (*Clathria*) *nicoleae* (UFPB.POR.175); (C-E) Holotype of *Amphioplus camamuensis* (UFPB.ECH.2158); (C) Aboral view; (D) Aboral view of the disc; (E) Oral view.

orders, 43 families, 62 genera, and 93 species of Cnidaria, and five classes, 17 orders, 38 families, 65 genera, and 103 species of Echinodermata, which are listed in this paper.

Among the Porifera, the orders Tetractinellida (16 species), Poecilosclerida (12 spp.), Haplosclerida (11 spp.), Clionaida (10 spp.), Dictyoceratida (9 spp.) and Verongiida (9 spp.) are the most representative in terms of specific diversity (Fig. 1A). On the other hand, Agelasida and Dendroceratida are less represented taxa, with only one species each. However, a large part of this collection (about 70%) is still unidentified and their specimens have received no voucher numbers. Among the cnidarians, the orders with larger and smaller number of species are Scleractinia (25 spp.), Leptothecata (25 spp.), Rhizostomeae (1 spp.), Semaeostomeae (1 spp.), and Chirodropida (1 spp.), respectively (Fig. 1B). The most representative orders of echinoderms are Amphilepidida (32 spp.), Dendrochirotida (17 spp.), and Ophiacanthida (10 spp.), while the least presented orders are Cidaroida, Echinoneoida, and Synallactida, with a single species each (Fig. 1C). The collections of Cnidaria and Echinodermata have 95% of their samples identified and registered with voucher numbers. While, these values for Porifera, Cnidaria, and Echinodermata correspond to 5%, 7%, and 13% of the total CIPY collection, respectively (Fig. 2).

The paratypes of the species *Clathria (Clathria) nicoleae* Barros, Santos & Pinheiro, 2013 (Porifera, Fig. 3B), *Damiria paraibana* Santos & Pinheiro 2013 (Porifera), *Plexaurella regia* Castro, 1989 (Cnidaria, Fig. 3A), and *Pentamera paraibanensis* Prata & Christoffersen, 2016 (Echinodermata), and the holotypes of the latter species and of *Amphioplus camamuensis* Manso, 2004 (Echinodermata, Fig. 3C-E), *Havelockia nietae* Prata, Manso & Christoffersen, 2020 (Echinodermata), *Thyone brasiliana* Prata, Manso & Christoffersen, 2020 (Echinodermata), and *Dercitus (Stoeba) pseudodiscorhabda* Santos & Pinheiro, 2016 (Porifera) are also housed in the CIPY.

Phylum Porifera Grant, 1836
Class Calcarea Bowerbank, 1862
Voucher numbers. — UFPB.POR.50, 458, 460, 461, 462, 464, 465, 466, 468, 469, 470, 471, 472, 473, 474, 476, 477, 491.
CIPY records. — PB and PE.
Notes. — From shallow reefs and Project Algas-PB, 10 to 33 m depth.

Order Leucosolenida Hartman, 1958
Family Amphoriscidae Dendy, 1893
Voucher number. — UFPB.POR.195.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Sycettidae Dendy, 1893
***Sycon* sp.**
Voucher number. — UFPB.POR.774.
CIPY record. — PE.
Notes. — From shallow reefs.

Class Demospongiae Sollas, 1885
Order Agelasida Hartman, 1980
Family Agelasidae Verrill, 1907
Agelas dispar Duchassaing & Michelotti, 1864
Voucher number. — UFPB.POR.073.
CIPY record. — PB.
Notes. — From Project Algas-PB, 24 m depth.

Order Axinellida Lévi, 1953
Family Axinellidae Carter, 1875
***Axinella* sp.**
Voucher numbers. — UFPB.POR.043, 112, 113, 115, 439, 440, 441.
CIPY record. — PB.
Notes. — From Project Algas-PB, 10 to 34 m depth.
Dragmacidon reticulatum (Ridley & Dendy, 1886)
Voucher number. — UFPB.POR.184.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Raspailiidae Nardo, 1833
Echinodictyum dendroides Hechtel, 1983
Voucher number. — UFPB.POR.513.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Bubarida Morrow & Cárdenas, 2015
Family Desmanthidae Topsent, 1893
Petromica (Chaladesma) ciocalyptoides (van Soest & Zea, 1986)
Voucher numbers. — UFPB.POR.044, 178, 610.
CIPY records. — PB and BA.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 17 m of depth.

Family Dictyonellidae van Soest, Diaz & Pomponi, 1990
***Dictyonella* sp.**

Voucher numbers. — UFPB.POR.180, 753, 754.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Chondrillida Redmond, Morrow, Thacker, Diaz, Boury-Esnault, Cardenas, Hajdu, Lobo-Hajdu, Picton, Pomponi, Kayal & Collins, 2013
Family Chondrillidae Gray, 1872
Chondrilla nucula Schmidt, 1862
Voucher numbers. — UFPB.POR.008, 032, 034, 080, 096, 171, 174, 193, 222, 293, 295, 363, 388, 393, 394, 395, 495, 504.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 34 m depth.

Order Chondrosiida Boury-Esnault & Lopes, 1985
Family Chondrosiidae Schulze, 1877
Chondrosia collectrix (Schmidt, 1870)
Voucher numbers. — UFPB.POR.004, 033, 058, 059, 167, 583, 745, 749.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Clionaida Morrow & Cárdenas, 2015
Family Clionaidae d'Orbigny, 1851
***Cervicornia* sp.**
Voucher numbers. — UFPB.POR.309, 379.
CIPY record. — PB.
Notes. — From Project Algas-PB, 20 to 21 m depth.

Cliona celata Grant, 1826
Voucher numbers. — UFPB.POR.016, 081.
CIPY record. — PB.
Notes. — From shallow reefs.

Cliona* cf. *dioryssa (de Laubenfels, 1950)
Voucher number. — UFPB.POR.157.
CIPY record. — PB.
Notes. — From shallow reefs.

Cliona varians (Duchassaing & Michelotti, 1864)
Voucher numbers. — UFPB.POR.021, 025, 078, 387, 389, 390, 407, 408, 409, 410, 412, 485.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 26 m of depth.

***Cliona* sp.**
Voucher numbers. — UFPB.POR.048, 165, 766.
CIPY record. — PB.
Notes. — From shallow reefs.

Spheciospongia symbiotica Hechtel, 1983
Voucher numbers. — UFPB.POR.381, 382, 383, 411, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422.
CIPY record. — PB.
Notes. — From Project Algas-PB, 10 to 33 m depth.

***Spheciospongia* sp.**
Voucher numbers. — UFPB.POR.117, 423, 424, 425.
CIPY record. — PB.
Notes. — From Project Algas-PB, 10 to 35 m depth.

Family Placospongiidae Gray, 1867
Placospongia carinata (Bowerbank, 1858)
Voucher numbers. — UFPB.POR.003, 752.
CIPY record. — PB.
Notes. — From shallow reefs.

Placospongia melobesioides Gray, 1867
Voucher numbers. — UFPB.POR.031, 152, 191, 574, 750.
CIPY record. — PB.
Notes. — From shallow reefs.

***Placospongia* sp.**
Voucher number. — UFPB.POR.751.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Dendroceratida Minchin, 1900
Family Darwinellidae Merejkowsky, 1879
Chelonaplysilla erecta (Row, 1911)
Voucher numbers. — UFPB.POR.769.
CIPY record. — PB.
Notes. — From Alice shipwreck (07°03′08″S 34°46′07″W, João Pessoa, PB, 7 to 12 m depth).

Order Dictyoceratida Minchin, 1900
Family Dysideidae Gray, 1867
Dysidea etheria Laubenfels, 1936
Voucher number. — UFPB.POR.567.
CIPY record. — PB.
Notes. — From 10 m depth.

Dysidea janiae (Duchassaing & Michelotti, 1864)
Voucher number. — UFPB.POR.580.
CIPY record. — BA.
Notes. — From shallow reefs.

Dysidea robusta Vilanova & Muricy, 2001
Voucher number. — UFPB.POR.006.
CIPY record. — PB.
Notes. — From shallow reefs.

***Dysidea* sp.**
Voucher numbers. — UFPB.POR.086, 091, 202, 372, 431.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 30 m depth.

Family Spongiidae Gray, 1867
***Spongia* sp.**
Voucher number. — UFPB.POR.737.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Thorectidae Bergquist, 1978
Hyrtios proteus Duchassaing & Michelotti, 1864
Voucher number. — UFPB.POR.024.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Irciniidae Gray, 1867
Ircinia felix (Duchassaing & Michelotti, 1864)
Voucher numbers. — UFPB.POR088, 558, 743.
CIPY record. — PB.
Notes. — From intertidal to 10 m depth.

Ircinia strobilina (Lamarck, 1816)
Voucher numbers. — UFPB.POR.009, 111, 122, 442, 738.
CIPY record. — PB.
Notes. — From shallow-reefs, Queimado shipwreck (07°05.070'S 34°44.852'W, João Pessoa, PB, 12 to 18 m), and Project Algas-PB. Intertidal to 33 m depth.

***Ircinia* sp.**
Voucher numbers. — UFPB.POR.017, 018, 023, 027, 135, 143, 194, 196, 374, 432, 433, 434, 435, 739.
CIPY record. — PB.
Notes. — From shallow reefs, Queimado shipwreck, and Project Algas-PB. Intertidal to 30 m depth.
Order Haplosclerida Topsent, 1928
Family Callyspongiidae Laubenfels, 1936

Callyspongia (Cladochalina) aculeata (Linnaeus, 1759)
Voucher numbers. — UFPB.POR.607, 612.
CIPY record. — BA.
Notes. — From Bretagne shipwreck (13°00′31″S 38°32′38″W, Salvador, BA, 7 to 12 m depth) and Porto da Barra Beach.

Family Chalinidae Gray, 1867
Cladocroce caelum Santos, Da Silva, Alliz & Pinheiro, 2014
Voucher number. — UFPB.POR.527.
CIPY record. — PB.
Notes. — From shallow reefs.

Haliclona (Reniera) implexiformis (Hechtel, 1965)
Voucher number. — UFPB.POR.340.
CIPY record. — PB.
Notes. — From shallow reefs.

Haliclona (Reniera) manglaris Alcolado, 1984
Voucher numbers. — UFPB.POR.347, 352.
CIPY record. — PB.
Notes. — From shallow reefs.

Haliclona (Soestella) melana Muricy & Ribeiro, 1999
Voucher numbers. — UFPB.POR.523, 548.
CIPY record. — PB.
Notes. — From shallow reefs.

***Haliclona* sp.**
Voucher numbers. — UFPB.POR.005, 026, 060, 082, 083, 085, 153, 201, 351, 511, 755, 756.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Niphatidae Van Soest, 1980
Amphimedon compressa Duchassaing & Michelotti, 1864
Voucher numbers. — UFPB.POR.166, 541.
CIPY record. — PB.
Notes. — From shallow reefs.

Amphimedon viridis Duchassaing & Michelotti, 1864
Voucher numbers. — UFPB.POR.089, 138, 154, 162, 556.
CIPY record. — PB.
Notes. — From shallow reefs.
Niphates erecta Duchassaing & Michelotti, 1864
Voucher numbers. — UFPB.POR.079, 087, 093, 538.
CIPY record. — PB.
Notes. — From shallow reefs.

***Niphates* sp.**
Voucher numbers. — UFPB.POR.514, 520.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Phloeodictyidae Carter, 1882
Oceanapia bartschi (Laubenfels, 1934)
Voucher numbers. — UFPB.POR.71, 362, 367, 436.
CIPY record. — PB.
Notes. — From Project Algas-PB, 26 to 30 m depth.

Order Poecilosclerida Topsent, 1928
Family Coelosphaeridae Dendy, 1922
***Lissodendoryx* sp.**
Voucher number. — UFPB.POR.605.
CIPY record. — BA.
Notes. — From Ilha dos Frades, Baía de Todos os Santos (Salvador).

Family Crambeidae Lévi, 1963
Monanchora arbuscula (Duchassaing & Michelotti, 1864)
Voucher number. — UFPB.POR.771.
CIPY record. — PB.
Notes. — From Queimado shipwreck.

Family Iotrochotidae Dendy, 1922
Iotrochota birotulata (Higgin, 1877)
Voucher number. — UFPB.POR.614.
CIPY record. — BA.
Notes. — From shallow waters.

Family Microcionidae Carter, 1875
Clathria (Clathria) nicoleae Vieira de Barros, Garcia Santos & Pinheiro, 2013
Voucher numbers. — UFPB.POR.175, 181.
CIPY record. — PB.
Notes. — From shallow reefs and sponge garden. Paratypes.

Family Mycalidae Lundbeck, 1905
Mycale (Arenochalina) laxissima (Duchassaing & Michelotti, 1864)
Voucher number. — UFPB.POR.051.
CIPY record. — BA.
Notes. — From the intertidal at Abrolhos Archipelago.
***Mycale (Mycale)* sp.**
Voucher number. — UFPB.POR.164.
CIPY record. — PB.
Notes. — From shallow reefs.

Mycale (Zygomycale) angulosa (Duchassaing & Michelotti, 1864)
Voucher numbers. — UFPB.POR.011, 613.
CIPY records. — PB and BA.
Notes. — From Blackadder shipwreck (12°56′12″S 38°30′38″W, in front of Boa Viagem Beach, Salvador, BA, 8 to 15 m depth) and Project Algas-PB, 26 m depth.

Family Acarnidae Dendy, 1922
Damiria paraibana Santos & Pinheiro 2013
Voucher number. — UFPB.POR.179.
CIPY record. — PB.
Notes. — From shallow reefs. Paratype.

Family Desmacididae Schmidt, 1870
Desmapsamma anchorata (Carter, 1882)
Voucher numbers. — UFPB.POR.552, 606.
CIPY records. — PB and BA.
Notes. — From shallow reefs to 10 m depth.

***Desmapsamma* sp.**
Voucher number. — UFPB.POR.301.
CIPY record. — PB.
Notes. — From Project Algas-PB, 30 m depth.

Family Tedaniidae Ridley & Dendy, 1886
Tedania (Tedania) ignis (Duchassaing & Michelotti, 1864)
Voucher numbers. — UFPB.POR.001, 052, 053, 055, 061, 062, 149, 158, 160, 192, 250, 530, 566, 757, 758, 759, 760, 761, 762, 764, 772.
CIPY record. — PB.
Notes. — From shallow reefs. Intertidal to 10 m depth.

***Tedania (Tedania)* sp.**
Voucher numbers. — UFPB.POR.161, 763.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Suberitida Chombard & Boury-Esnault, 1999
Family Halichondriidae Gray, 1867
Halichondria (Halichondria) melanadocia Laubenfels, 1936
Voucher numbers. — UFPB.POR.268, 346, 349.
CIPY record. — PB.
Notes. — From shallow reefs.

Topsentia ophiraphidites (Laubenfels, 1934)
Voucher numbers. — UFPB.POR.038, 049, 360, 437, 438, 615.

CIPY records. — PB and BA.
Notes. — From shallow reefs and Project Algas-PB, intertidal to 34 m depth.

Family Suberitidae Schmidt, 1870
***Aaptos* sp.**
Voucher numbers. — UFPB.POR.602, 609.
CIPY record. — BA.
Notes. — From shallow reefs.

***Protosuberites* sp.**
Voucher numbers. — UFPB.POR.002, 012, 019.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Tethyida Morrow & Cárdenas, 2015
Family Tethyidae Gray, 1848
***Tethya* sp.**
Voucher number. — UFPB.POR.426.
CIPY record. — PB.
Notes. — From Project Algas-PB, 35 m depth.

***Xenospongia* sp.**
Voucher number. — UFPB.POR.773.
CIPY record. — PB.
Notes. — From Alvarenga shipwreck.

Family Timeidae Topsent, 1928
Timea bioxyasterina Mothes, Santos & Campos, 2004
Voucher numbers. — UFPB.POR.098, 292.
CIPY record. — PB.
Notes. — From Project Algas-PB, 13 to 26 m depth.

***Timea* sp.**
Voucher number. — UFPB.POR.173.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Tetractinellida Marshall, 1876
Family Ancorinidae Schmidt, 1870
Dercitus (Stoeba) pseudodiscorhabda Santos & Pinheiro, 2016
Voucher number. — UFPB.POR.151.
CIPY record. — PB.
Notes. — From shallow reefs. Holotype.

***Jaspis* sp.**
Voucher numbers. — UFPB.POR.361, 398.
CIPY record. — PB.
Notes. — From Project Algas-PB, 26 to 32 m depth.

Stelletta anancora (Sollas, 1886)
Voucher numbers. — UFPB.POR.0.46, 076, 100, 101, 358, 405.
CIPY record. — PB.
Notes. — From Project Algas-PB, 9 to 40 m depth.

Stelletta beae Hajdu & Carvalho, 2003
Voucher numbers. — UFPB.POR.145, 146, 159.
CIPY record. — PB.
Notes. — From shallow reefs.

***Stelletta* sp.**
Voucher numbers. — UFPB.POR.102, 406.
CIPY record. — PB.
Notes. — From Project Algas-PB, 20 to 33 m depth.

Family Geodiidae Gray, 1867
Erylus formosus Sollas, 1886
Voucher numbers. — UFPB.POR.075, 104, 402, 403, 740.
CIPY record. — PB.
Notes. — From Queimado shipwreck and Project Algas-PB, 12 to 34 m depth.

Geodia corticostylifera Hajdu, Muricy, Custodio, Russo & Peixinho, 1992
Voucher numbers. — UFPB.POR.047, 064, 066, 401.
CIPY record. — PB.
Notes. — From Project Algas-PB, 11 to 28 m depth.

Geodia gibberosa Lamarck, 1815
Voucher numbers. — UFPB.POR.092, 163, 550, 608, 691.
CIPY records. — PB and BA.
Notes. — From shallow reefs. Intertidal to 10 m depth.

Geodia neptuni (Sollas, 1886)
Voucher numbers. — UFPB.POR.068, 105, 399, 741.
CIPY record. — PB.
Notes. — From Queimado shipwreck and Project Algas-PB, 11 to 20 m depth.

***Geodia* sp.**
Voucher numbers. — UFPB.POR.067, 251, 260, 263, 400, 451.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 30 m depth.

Penares anisoxia Boury-Esnault, 1973
Voucher numbers. — UFPB.POR.116, 404, 510.
CIPY record. — PB.
Notes. — From Project Algas-PB, 26 to 34 m depth.

***Penares* sp.**
Voucher number. — UFPB.POR.118.
CIPY record. — PB.
Notes. — From Project Algas-PB, 30 m depth.

Family Tetillidae Sollas, 1886
Cinachyrella alloclada (Uliczka, 1929)
Voucher numbers. — UFPB.POR.007, 020, 037, 054, 056, 057, 074, 090, 139, 169, 224, 256, 345, 551, 589, 593, 603.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 10 m depth.

Cinachyrella apion (Uliczka, 1929)
Voucher number. — UFPB.POR.042.
CIPY record. — PB.
Notes. — From Project Algas-PB, 10 m depth.

Cinachyrella kuekenthali (Uliczka, 1929)
Voucher number. — UFPB.POR.521.
CIPY record. — PB.
Notes. — From shallow reefs.

***Cinachyrella* sp.**
Voucher numbers. — UFPB.POR.177, 391, 392, 396, 452, 453, 454, 455, 456, 457, 509.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 34 m depth.

Order Verongiida Bergquist, 1978
Family Aplysinidae Carter, 1875
Aiolochroia crassa (Hyatt, 1875)
Voucher numbers. — UFPB.POR.099, 108, 109, 110, 132, 767, 768.
CIPY record. — PB.
Notes. — From Project Algas-PB and shipwreck of Queimado, 12 to 34 m depth.

Aplysina alcicornis Pinheiro, Hajdu & Custódio, 2007
Voucher numbers. — UFPB.POR.095, 097.
CIPY record. — PB.
Notes. — From shallow reefs.

Aplysina cauliformis (Carter, 1882)
Voucher number. — UFPB.POR.077.
CIPY record. — PB.
Notes. — From Canyons of João Pessoa, 40 m depth.

Aplysina fistularis (Pallas, 1766)
Voucher numbers. — UFPB.POR.065, 069, 103, 106, 770.
CIPY record. — PB.
Notes. — From Canyons of João Pessoa and Project Algas-PB, 26 to 40 m depth.

Aplysina fulva (Pallas, 1766)
Voucher numbers. — UFPB.POR.553, 744.
CIPY record. — PB.
Notes. — From shallow reefs and 10 m depth.

Aplysina pergamentacea Hechtel, 1983
Voucher number. — UFPB.POR.189.
CIPY record. — PB.
Notes. — From shallow reefs.

Aplysina pseudolacunosa Pinheiro, Hajdu & Custódio, 2007
Voucher number. — UFPB.POR.107.
CIPY record. — PB.
Notes. — From Project Algas-PB, 33 m depth.

Aplysina solangeae Pinheiro, Hajdu & Custódio, 2007
Voucher numbers. — UFPB.POR.126, 579.
CIPY records. — PB and BA.
Notes. — From shallow reefs and Queimado shipwreck.

***Aplysina* sp.**
Voucher numbers. — UFPB.POR.045, 063, 176, 304, 356, 364, 397, 428, 429, 430.
CIPY record. — PB.
Notes. — From shallow reefs, Canyons of João Pessoa, and Project Algas-PB. Intertidal to 38 m depth.

Class Homoscleromorpha Bergquist, 1978
Order Homosclerophorida Dendy, 1905
Family Plakinidae Schulze, 1880
***Plakinastrella* sp1.**
Voucher number. — UFPB.POR.450.
CIPY record. — PB.
Notes. — From Project Algas-PB, 35 m depth.

***Plakinastrella* sp2.**
Voucher number. — UFPB.POR.449.
CIPY record. — PB.
Notes. — From Project Algas-PB, 26 m depth.

Phylum Cnidaria Hatschek, 1888
Class Hydrozoa Owen, 1843
Order Anthoathecata Cornelius, 1992
Family Bougainvilliidae Lütken, 1850
***Bimeria* sp.**
Voucher numbers. — UFPB.CNID.1057, 1067, 1075.
CIPY record. — PB.
Notes. — From shallow reefs. Some colonies associated with *Thyroscyphus ramosus* Allman, 1877 and *Eudendrium* sp.

Family Eudendriidae L. Agassiz, 1862
Eudendrium carneum Clarke, 1882
Voucher numbers. — UFPB.CNID.983, 1056, 1069.
CIPY record. — PB.
Notes. — From shallow reefs.

***Eudendrium* sp.**
Voucher numbers. — UFPB.CNID.876, 972, 976, 1066.
CIPY records. — RN and PB.
Notes. — From shallow reefs and hypersaline mangroves.

Family Porpitidae Goldfuss, 1818
***Velella* sp.**
Voucher numbers. — UFPB.CNID.685, 937.
CIPY record. — PB.
Notes. — From entrance to River Miriri and Seixas Beach (João Pessoa, PB).

Family Stylasteridae Gray, 1847
Stylaster roseus (Pallas, 1766)
Voucher numbers. — UFPB.CNID.536, 797.
CIPY record. — PB.
Notes. — From shallow reefs.

Order Capitata Kühn, 1913
Family Milleporidae Fleming, 1928
Millepora alcicornis Linnaeus, 1758
Voucher numbers. — UFPB.CNID.001, 017, 032, 061, 132, 146, 147, 160, 179, 197, 257, 314, 321, 333, 401, 421, 480, 865, 922, 1095.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with the scleractinian coral *Agaricia agaricites* (Linnaeus, 1758).

Millepora braziliensis Verrill, 1868
Voucher numbers. — UFPB.CNID.006, 018, 087, 088, 232, 258, 322, 334, 343, 350.
CIPY records. — PB, PE, and AL.
Notes. — From shallow reefs. Some colonies associated with *A. agaricites* and the barnacles *Megabalanus stultus* (Darwin, 1854).

Millepora nitida Verrill, 1868
Voucher number. — UFPB.CNID.207.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

***Millepora* sp.**
Voucher numbers. — UFPB.CNID.140, 180, 198, 422, 423, 929, 969.
CIPY records. — PB and BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Family Pennariidae McCrady, 1859
Pennaria disticha Goldfuss, 1820
Voucher numbers. — UFPB.CNID.831, 849, 979, 1009.
CIPY record. — PB.
Notes. — From shallow reefs to 15 m depth.

Order Leptothecata Cornelius, 1992
Family Aequoreidae Eschscholtz, 1829
Aequorea macrodactyla (Brandt, 1835)
Voucher numbers. — UFPB.CNID.1121.
CIPY record. — RJ.
Notes. — From 95 m depth.

Family Aglaopheniidae Marktanner-Turneretscher, 1890
Aglaophenia latecarinata Allman, 1887
Voucher numbers. — UFPB.CNID.830, 834, 867, 868, 874, 909, 917, 920, 940, 943, 944, 945, 946, 947, 948, 949, 950, 951, 954, 958, 970, 1006, 1065, 1078.
CIPY records. — RN and PB.
Notes. — From shallow reefs, hypersaline mangroves, and Project Algas-PB. Intertidal to 34 m depth. Some colonies associated with *T. ramosus* and *Hyncksella* sp.

Lytocarpia tridentata (Versluys, 1899)
Voucher numbers. — UFPB.CNID.903, 959.
CIPY record. — PB.
Notes. — From intertidal.

Macrorhynchia philippina Kirchenpauer, 1872
Voucher number. — UFPB.CNID.1005.

CIPY record. — PB.
Notes. — From Queimado shipwreck.

Family Campanulariidae Johsnton, 1836
Clytia linearis (Thornely, 1900)
Voucher number. — UFPB.CNID.1072.
CIPY record. — PB.
Notes. — From shallow reefs.

***Clytia* sp.**
Voucher numbers. — UFPB.CNID.875, 971, 974, 989, 1076.
CIPY records. MA, RN, and PB.
Notes. — From shallow reefs and hypersaline mangroves. Some colonies found between rocks and associated with algae.

Family Haleciidae Hincks, 1868
Halecium dyssymetrum Billard, 1929
Voucher number. — UFPB.CNID.977.
CIPY record. — RN.
Notes. — From hypersaline mangroves.

Nemalecium lighti (Hargitt, 1924)
Voucher number. — UFPB.CNID.993.
CIPY record. — SP.
Notes. — From intertidal.

Family Halopteridiidae Millard, 1962
Antennella curvitheca Fraser, 1937
Voucher number. — UFPB.CNID.902.
CIPY record. — PB.
Notes. — From shallow reefs.

Halopteris carinata Allaman, 1877
Voucher numbers. — UFPB.CNID.824, 961, 962.
CIPY record. — PB.
Notes. — From rhodolith beds, 10 to 20 m depth.

Family Hebellidae Fraser, 1912
***Hebella* sp.**
Voucher number. — UFPB.CNID.988.
CIPY record. — MA.
Notes. — From shallow waters, associated with the hydrozoan *Sertularelloides cylindritheca* (Allman, 1888).

Family Kirchenpaueriidae Stechow, 1921
Pycnotheca mirabilis (Allman, 1883)
Voucher number. — UFPB.CNID.997.
CIPY record. — PB.
Notes. — From rhodolith beds, 15 m depth.

Family Plumulariidae McCrady, 1859
Dentitheca bidentata (Jäderholm, 1905)
Voucher numbers. — UFPB.CNID.938, 996, 1098.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 20 m depth. Some colonies associated with algae and rhodoliths.

Plumularia margaretta (Nutting, 1900)
Voucher numbers. — UFPB.CNID.843, 978, 1060, 1063, 1097.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 14 m depth. Some colonies associated with algae.

***Plumularia* sp.**
Voucher number. — UFPB.CNID.973.
CIPY record. — RN.
Notes. — From hypersaline mangroves.

Family Sertulariidae Lamouroux, 1812
Amphisbetia distans (Lamouroux, 1816)
Voucher numbers. — UFPB.CNID.516, 816, 833, 845, 872, 880, 881, 908, 911, 928, 956, 975, 984, 990, 1055, 1074.
CIPY records. — RN, PB, and SP.
Notes. — From shallow reefs, rocky shore, hypersaline mangroves, and Project Algas-PB. Intertidal to 16 m depth. Some colonies associated with algae, Actinaria, and *T. ramosus*.

Dynamena crisioides Lamouroux, 1824
Voucher numbers. — UFPB.CNID.540, 544, 957, 1058, 1071.
CIPY records. — MA, PB, and AL.
Notes. — From shallow reefs.

Dynamena disticha (Bosc, 1802)
Voucher number. — UFPB.CNID.995.
CIPY record. — SP.
Notes. — From rocky shore, associated with the algae *Sargassum* sp.

Dynamena quadridentata (Ellis & Solander, 1786)
Voucher numbers. — UFPB.CNID.994, 1059.

CIPY records. — PB and SP.
Notes. — From shallow reef and rocky shore. Some colonies associated with the algae *Sargassum* sp.

Idiellana pristis (Lamouroux, 1816)
Voucher numbers. — UFPB.CNID.835, 987.
CIPY records. — MA and PB.
Notes. — From shallow reefs.

Sertularia marginata (Kirchenpauer, 1864)
Voucher numbers. — UFPB.CNID.826, 829, 844, 866, 869, 871, 907, 912, 914, 926, 927, 960, 982, 991, 1016, 1017, 1018, 1019, 1054, 1068, 1070, 1077.
CIPY records. — RN, PB, and SP.
Notes. — From shallow reefs, rocky shore, rhodolith beds, and hypersaline mangroves. Intertidal to 20 m depth. Some colonies found under rock and associated with algae and sponges.

Sertularia turbinata (Lamouroux, 1816)
Voucher number. — UFPB.CNID.992.
CIPY record. — SP.
Notes. — Colony found under rock.

Family Syntheciidae von Marktanner-Turneretscher, 1890
***Hincksella* sp.**
Voucher numbers. — UFPB.CNID.513, 514, 517, 815, 916, 952, 1073.
CIPY record. — PB.
Notes. — From shallow reefs and the Port in Cabedelo (PB). Intertidal to 8.7 m depth.

Family Thyroscyphidae Stechow, 1920
Thyroscyphus ramosus Allman, 1877
Voucher numbers. — UFPB.CNID.069, 098, 515, 518, 519, 521, 523, 524, 525, 526, 528, 529, 530, 531, 532, 533, 534, 537, 538, 539, 541, 542, 543, 545, 546, 547, 549, 551, 553, 555, 556, 557, 558, 559, 560, 561, 562, 563, 565, 566, 567, 568, 569, 570, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 590, 809, 810, 820, 822, 825, 827, 860, 870, 904, 905, 910, 913, 919, 925, 953, 963, 981, 1010, 1011, 1012, 1013, 1014, 1015, 1052, 1061, 1062.
CIPY records. — PA, MA, RN, PB, PE, and AL.
Notes. — From shallow reefs, mangroves, hypersaline mangroves, Paraíba do Norte River estuary (PB), Project Algas-PB, and Geomar. Intertidal to 34 m depth. Some colonies found under rocks, in rhodolith beds, associated with algae and seagrass.

Sertularelloides cylindritheca (Allman, 1888)
Voucher numbers. — UFPB.CNID. 068, 094, 520, 522, 527, 799, 801, 832, 873, 906, 915, 939, 955, 980, 1053, 1064.
CIPY records. — RN, PB, PE, and MA.
Notes. — From shallow reefs, hypersaline mangrove, and Queimado shipwreck. Intertidal to 14 m depth. Some colonies found between rocks, associated with sponges and algae.

Order Siphonophorae Eschscholtz, 1829
Family Physaliidae Brandt, 1835
Physalia physalis (Linnaeus, 1758)
Voucher numbers. — UFPB.CNID.701, 842, 846, 847, 848, 931, 1096.
CIPY records. — PB and BA.
Notes. — Colonies found stranded on the beach.

***Physalia* sp.**
Voucher numbers. — UFPB.CNID.689, 696.
CIPY record. — PB.
Notes. — Colonies found stranded on the beach.

Class Scyphozoa Goette, 1887
Order Rhizostomeae Cuvier, 1799
Family Stomolophidae Haeckel, 1880
Stomolophus meleagris Agassiz, 1862
Voucher number. — UFPB.CNID.686.
CIPY record. — PB.
Notes. — From Mamanguape River estuary.

Order Semaeostomeae L. Agassiz, 1862
Family Pelagiidae Gegenbaur, 1856
Chrysaora lactea Eschscholtz, 1829
Voucher number. — UFPB.CNID.691
CIPY record. — PB.
Notes. — From Cabo Branco beach (João Pessoa).

Class Cubozoa Werner, 1973
Order Chirodropida Haeckel, 1880
Family Chiropsalmidae Thiel, 1936
Chiropsalmus quadrumanus (F. Muller, 1859)
Voucher numbers. — UFPB.CNID.461, 706, 895, 1099.
CIPY record. — PB.
Notes. — From urban beaches in João Pessoa and Mamanguape River estuary. Some colonies captured with trawl.

Class Anthozoa Ehrenberg, 1834

Order Scleractinia Bourne, 1900
Family Agariciidae Gray, 1847
Agaricia agaricites (Linnaues, 1758)
Voucher numbers. — UFPB.CNID.004, 015, 024, 025, 027, 028, 058, 063, 089, 106, 123, 129, 142, 154, 168, 184, 194, 230, 240, 249, 263, 308, 319, 327, 331, 341, 400, 408, 410, 416, 418, 966, 968.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with barnacles, the hydrocoral *M. alcicornis*, and the corals *Favia gravida* Verrill, 1868, *Siderastrea stellata* Verrill, 1868, *Mussismilia harttii* (Verrill, 1868), *M. hispida* (Verrill, 1902), *Porites astreoides* Lamark, 1816, and *Porites* sp.

Agaricia fragilis Dana, 1848
Voucher numbers. — UFPB.CNID.153, 155.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

Agaricia* cf. *lamarcki Milne Edwards & Haime, 1851
Voucher number. — UFPB.CNID.399.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

***Agaricia* sp.**
Voucher numbers. — UFPB.CNID.002, 005, 071, 091, 407, 409, 411, 434, 436, 448, 473.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Intertidal to 9 m depth.

Family Faviidae Milne Edwards & Haime, 1857
Favia gravida Verrill, 1868
Voucher numbers. — UFPB.CNID.016, 059, 065, 072, 075, 079, 099, 114, 124, 130, 143, 156, 169, 177, 185, 195, 205, 214, 216, 218, 223, 231, 241, 245, 247, 250, 261, 264, 268, 271, 306, 310, 320, 328, 332, 342, 405, 415, 439, 440, 465, 477, 492, 863, 878, 924, 999, 1022, 1042.
CIPY records. — CE, PB, PE, AL, BA, and ES.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with *Porites branneri* Rathbun, 1888, *A. agaricites*, *S. stellata*, and *M. harttii*.

***Favia* sp.**
Voucher numbers. — UFPB.CNID.060, 470.
CIPY records. — PE and BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Mussismilia braziliensis (Verrill, 1868)
Voucher numbers. — UFPB.CNID.134, 162, 172, 175, 181, 188, 212.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago. Some colonies associated with *P. branneri*.

Mussismilia harttii (Verrill, 1868)
Voucher numbers. — UFPB.CNID.003, 008, 012, 013, 014, 020, 026, 076, 118, 125, 135, 149, 163, 199, 233, 251, 259, 265, 269, 303, 316, 324, 336, 345, 404, 412, 413, 420, 474, 589, 941, 1114.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Intertidal to 9 m depth. Some colonies associated with *F. gravida*, *P. astreoides*, *P. branneri*, *A. agaricites*, and *Agaricia* sp.

Mussismilia hispida (Verrill, 1902)
Voucher numbers. — UFPB.CNID.009, 021, 150, 164, 176, 182, 189, 190, 200, 234, 255, 266, 304, 317, 325, 337, 346, 403, 414, 805.
CIPY records. — PB, PE, AL, BA, and RJ.
Notes. — From shallow reefs, rocky shore, Abrolhos Archipelago, and Port of Cabedelo (PB). Intertidal to 8 m depth. Some colonies associated with *A. agaricites* and *Astrangia* sp.

Mussismilia leptophylla (Verrill, 1868)
Voucher numbers. — UFPB.CNID.144, 157, 178, 186, 210.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

***Mussismilia* sp.**
Voucher numbers. — UFPB.CNID.1116, 1117.
CIPY record. — PB.
Notes. — From shallow reefs.

Scolymia wellsii Laborel, 1967
Voucher numbers. — UFPB.CNID.034, 035, 036, 037, 038, 039, 040, 041, 050, 051, 052, 137, 167, 174, 203, 339, 348, 402, 438.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs, Abrolhos Archipelago, and Project Algas-PB. Intertidal to 28 m depth.

Family Meandrinidae Gray, 1847
Meandrina brasiliensis (Milne Edwards & Haime, 1848)

Voucher numbers. — UFPB.CNID.042, 043, 044, 045, 046, 047, 048, 131, 145, 159, 171, 187, 196, 206, 452, 793, 836.
CIPY records. — PB and BA.
Notes. — From shallow reefs, Port of Cabedelo (PB), Abrolhos Archipelago, and Project Algas-PB. Intertidal to 34 m depth.

***Meandrina* sp.**
Voucher number. — UFPB.CND.033
CIPY record. — PB.
Notes. — From Project Algas-PB, 34 m depth.

Family Montastraeidae Yabe & Sugiyama, 1941
Montastraea cavernosa (Linnaeus, 1767)
Voucher numbers. — UFPB.CNID.007, 108, 120, 133, 148, 161, 208, 267, 315, 323, 335, 344, 351.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Family Pocilloporidae Gray, 1840
Madracis decactis (Lyman, 1859)
Voucher numbers. — UFPB.CNID.158, 170, 211.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

Family Poritidae Gray, 1840
Porites astreoides Lamarck, 1816
Voucher numbers. — UFPB.CNID.022, 066, 074, 090, 100, 115, 126, 136, 165, 201, 213, 235, 242, 252, 312, 329, 347, 967, 1000, 1086.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with *M. harttii*, *F. gravida*, and *Agaricia* sp.

Porites branneri Rathbun, 1888
Voucher numbers. — UFPB.CNID.010, 080, 107, 127, 139, 151, 173, 183, 191, 202, 209, 236, 243, 253, 313, 338, 352, 406, 471.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with *F. gravida*, *S. stellata*, and *Millepora braziliensis*.

***Porites* sp.**
Voucher number. — UFPB.CNID.062.
CIPY record. — PE.
Notes. — From shallow reefs.

Family Rhizangiidae d'Orbigny, 1851
Astrangia solitaria (Le Sueur, 1818)
Voucher numbers. — UFPB.CNID.220, 309, 437, 442, 444, 445, 446, 447, 591, 806, 861, 1004, 1044, 1045, 1047, 1051.
CIPY records. — PI, PB, AL, and BA.
Notes. — From shallow reefs, Abrolhos Archipelago, and Queimado shipwreck. Intertidal to 15 m depth. Some specimens associated with rhodolith beds.

Astrangia rathbuni Vaughan, 1906
Voucher number. — UFPB.CNID.472.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

***Astrangia* sp.**
Voucher numbers. — UFPB.CNID.395, 804.
CIPY records. — AL and RJ.
Notes. — From shallow reef and rocky shore. Some specimens fixed on the basal branches of the octocoral *Leptogorgia* sp. and associated with *M. hispida*.

Family Caryophylliidae Dana, 1846
Phyllangia americana Milne Edwards & Haime, 1849
Voucher numbers. — UFPB.CNID.311, 435, 441, 443, 879, 1048.
CIPY records. — RN, PB, and AL.
Notes. — From shallow reefs.

Family Siderastreidae Vaughan & Wells, 1943
Siderastrea stellata Verrill, 1868
Voucher numbers. — UFPB.CNID.011, 023, 064, 067, 078, 081, 109, 128, 138, 141, 152, 166, 192, 193, 204, 215, 217, 219, 221, 222, 224, 225, 226, 227, 228, 229, 237, 238, 239, 244, 246, 248, 254, 256, 260, 262, 270, 272, 305, 307, 318, 326, 330, 340, 349, 353, 417, 419, 432, 433, 453, 466, 467, 468, 469, 475, 476, 478, 479, 481, 493, 655, 800, 812, 819, 850, 855, 862, 877, 923, 1001, 1021, 1043, 1046, 1049, 1050, 1094, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113.
CIPY records. — PI, CE, RN, PB, PE, AL, BA, and ES.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies with the barnacles *Ceratoconcha floridana* (Pilsbry, 1931), and associated with the soft coral *Zoanthus sociatus* (Ellis, 1768) and the scleractinian corals *P. branneri* and *F. gravida*.

Family Turbinoliidae Milne Edwards & Haime, 1848
***Sphenotrochus* sp.**
Voucher number. — UFPB.CNID.1115.
CIPY record. — PA.
Notes. — Collected by the Comissão Norte/Nordeste II, Oceanographic Ship Almirante Saldanha.

Order Zoantharia Gray, 1832
Family Sphenopidae Hertwig, 1882
Palythoa caribaeorum Duchassaing & Michelotti, 1860
Voucher numbers. — UFPB.CNID.053, 086, 093, 102, 104, 112, 463, 483, 490, 491, 592, 593, 594, 595, 5996, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 628, 629, 630, 631, 633, 634, 635, 662, 708, 777, 779, 781, 792, 808, 811, 837, 853, 858, 935, 1023, 1029, 1030, 1080, 1081.
CIPY records. — CE, RN, PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies associated with rhodolith beds.

Protopalythoa variabilis (Duerden, 1898)
Voucher numbers. — UFPB.CNID.054, 083, 487, 488, 495, 501, 502, 503, 504, 505, 506, 507, 510, 511, 512, 643, 644, 645, 646, 647, 648, 649, 653, 654, 657, 660, 663, 666, 669, 672, 684, 707, 711, 712, 715, 780, 787, 788, 789, 790, 794, 795, 796, 852, 857, 884, 898, 932, 1007, 1008, 1031, 1032, 1033, 1083, 1088.
CIPY records. — PI, CE, RN, PB, PE, AL, and BA.
Notes. — From shallow reefs.

Family Parazoanthidae Delage & Hérouard, 1901
***Parazoanthus* sp.**
Voucher numbers. — UFPB.CNID.918, 1092.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Zoanthidae Rafinesque, 1815
Isaurus tuberculatus Gray, 1828
Voucher numbers. — UFPB.CNID.489, 637, 638, 639, 640, 641, 642, 659, 665, 667, 679, 680, 717, 786, 791.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 34 m depth.

Zoanthus pulchellus (Duchassaing & Michelotti, 1860)
Voucher number. — UFPB.CNID.821.
CIPY record. — RN.
Notes. — From shallow reefs.

Zoanthus sociatus (Ellis, 1768)
Voucher numbers. — UFPB.CNID.084, 103, 424, 425, 426, 427, 428, 429, 430, 431, 484, 494, 496, 652, 661, 674, 678, 714, 778, 813, 817, 818, 838, 854, 859, 933, 1034, 1035, 1036, 1037, 1040, 1082, 1084, 1087.
CIPY records. — CE, RN, PB, PE, and AL.
Notes. — From shallow reefs.

Zoanthus solanderi Le Sueur, 1818
Voucher numbers. — UFPB.CNID.485, 486, 892, 921, 934.
CIPY records. — PB and AL.
Notes. — From shallow reefs.

***Zoanthus* sp.**
Voucher numbers. — UFPB.CNID.497, 498, 499, 500, 509, 627, 632, 636, 650, 651, 658, 668, 670, 671, 677, 682, 709, 710, 716, 718, 783, 785, 886, 942.
CIPY records. — CE, RN, PB, PE, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies found together with *P. caribaeorum*.

Order Actiniaria Hertwig, 1882
Family Actiniidae Rafinesque, 1815
Actinia bermudensis (McMurrich, 1889)
Voucher numbers. — UFPB.CNID.882, 1026, 1027, 1089.
CIPY record. — PB.
Notes. — From shallow reefs.

Actinostella flosculifera (Le Sueur, 1817)
Voucher numbers. — UFPB.CNID.376, 381, 398.
CIPY record. — BA.
Notes. — From shallow reefs.

Bunodosoma cangicum Belém & Preslercravo, 1973
Voucher numbers. — UFPB.CNID.082, 101, 369, 372, 378, 379, 380, 383, 386, 387, 388, 390, 656, 730, 731, 734, 735, 736, 746, 839, 883, 887, 893, 986, 1024, 1025, 1028, 1085.
CIPY records. — MA, PI, RN, PB, PE, AL, and BA.
Notes. — From shallow reefs and hypersaline mangroves.

***Bunodosoma* sp.**
Voucher number. — UFPB.CNID.803.
CIPY record. — PB.
Notes. — From shallow reefs.

Family Aliciidae Duerden, 1895
Lebrunia neglecta Duchassaing & Michelotti, 1860
Voucher number. — UFPB.CNID.389.
CIPY record. — AL.
Notes. — From shallow reefs.

Family Homostichanthidae Carlgren, 1900
Homostichanthus duerdeni Carlgren, 1900
Voucher numbers. — UFPB.CNID.382, 385.
CIPY record. — BA.
Notes. — From shallow reefs.

Order Alcyonacea Lamouroux, 1812
Family Ellisellidae Gray, 1859
***Ellisella* sp.**
Voucher number. — UFPB.CNID.459.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago.

Nicella guadalupensis (Duchassaing & Michelotti, 1860)
Voucher number. — UFPB.CNID.1119.
CIPY record. — RN.
Notes. — From continental shelf about 100 m depth. Associated with several individuals of the brittlestar *Hemieuryale pustulata* v. Martens, 1867.

Family Plexauridae Gray, 1859
Muriceopsis sulphurea (Donovan, 1825)
Voucher numbers. — UFPB.CNID.029, 111, 274, 277, 281, 284, 285, 288, 293, 296, 396, 455, 458, 460, 482, 998, 1003, 1041.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago. Some colonies found together with the ocotocoral *Olindagorgia gracilis* (Verrill, 1868).

Plexaurella grandiflora Verrill, 1912
Voucher numbers. — UFPB.CNID.030, 119, 275, 278, 289, 294, 298, 397, 454, 456, 457, 462, 664, 899, 930.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Plexaurella regia Castro, 1989
Voucher numbers. — UFPB.CNID.279, 290.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago. Paratypes.

Scleracis guadalupensis (Duchassaing & Michelotti, 1860)
Voucher number. — UFPB.CNID.1120.
CIPY record. — RN.
Notes. — From continental shelf, about 80 m depth, associated with specimens of the brittlestar *Ophiacantha* sp.

Family Gorgoniidae Lamouroux, 1812
Olindagorgia gracilis (Verrill, 1868)
Voucher number. — UFPB.CNID.291.
CIPY record. — BA.
Notes. — From Abrolhos Archipelago, associated with the octocorallia *M. sulphurea*.

Phyllogorgia dilatata (Esper, 1806)
Voucher numbers. — UFPB.CNID.273, 276, 280, 283, 287, 292.
CIPY record. — BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Leptogorgia punicea (Milne Edwards & Haime, 1857)
Voucher number. — UFPB.CNID.394.
CIPY record. — RJ.
Notes. — From Sepetiba Bay, associated with *Astrangia* sp.

Leptogorgia setacea (Pallas, 1766)
Voucher number. — UFPB.CNID.1118.
CIPY record. — RN.
Notes. — From hypersaline mangrove.

Family Clavulariidae Hickson, 1894
Carijoa riisei (Duchassaing & Michelotti, 1860)
Voucher numbers. — UFPB.CNID.105, 121, 122, 295, 297, 299, 300, 301, 302, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 798, 814, 885, 894, 1020, 1038, 1039.
CIPY records. — MA, CE, RN, PB, PE, and AL.
Notes. — From shallow reefs, Paraíba do Norte River estuary, and Alvarenga shipwreck (7º2′30″S 34º44′33″W, João Pessoa, PB, 18 to 20 m). Intertidal to 18 m depth. Some colonies associated with sponges.

Order Pennatulacea Verrill, 1865
Family Renillidae Gray, 1860
Renilla muelleri Kölliker, 1872
Voucher number. — UFPB.CNID.864.
CIPY record. — RN.
Notes. — From hypersaline mangroves.

Renilla reniformis (Pallas, 1766)
Voucher number. — UFPB.CNID.900.
CIPY record. — PB.
Notes. — From Baía da Traição Beach.

Phylum Echinodermata Bruguière, 1791
Class Crinoidea Miller, 1821
Order Comatulida A.H. Clark, 1908
Family Comatulidae Fleming, 1828
Comactinia echinoptera (Müller, 1840)
Voucher numbers. — UFPB.ECH.049, 1559.
CIPY record. — PB.
Notes. — From shallow reefs. Some specimens found on phytal of *Halimeda opuntia* (Linnaeus) J.V. Lamouroux, 1816.

Family Tropiometridae A.H. Clark, 1908
Tropiometra carinata (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.1014, 1080, 1478, 1534, 1565, 1567, 1568, 1979, 2010, 2289.
CIPY records. — PB, AL.
Notes. — From shallow reefs and Abrolhos Archipelago. Intertidal to 10 m depth.

Class Asteroidea de Blainville, 1830
Order Paxillosida Perrier, 1884
Family Astropectinidae Gray, 1840
Astropecten alligator Perrier, 1881
Voucher number. — UFPB.ECH.881.
CIPY record. — PB.
Notes. — From Project Algas-PB, 24 m depth.

Astropecten brasiliensis Müller & Troschel, 1842
Voucher number. — UFPB.ECH.1919.
CIPY record. — RN.
Notes. — Specimen found between rocks.

Astropecten marginatus Gray, 1840
Voucher numbers. — UFPB.ECH.864, 1427, 1839, 1840, 1841, 1842.
CIPY records. — RN, PB, PE, and SP.
Notes. — From sandy bottom. Some specimens from by-catch of fishes.

Family Luidiidae Sladen, 1889
Luidia alternata alternata (Say, 1825)
Voucher numbers. — UFPB.ECH.876, 877, 879.
CIPY record. — PB.
Notes. — From Project Algas-PB, 14 to 24 m depth.

Luidia clathrata (Say, 1825)
Voucher number. — UFPB.ECH.875.
CIPY record. — PB.
Notes. — From Project Algas-PB, 26 m depth.

Luidia ludwigi scotti Bell, 1917
Voucher number. — UFPB.ECH.878.
CIPY record. — PB.
Notes. — From Project Algas-PB, 20 m depth.

Luidia senegalensis (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.089, 1256, 1428, 1582, 1583, 1584, 1585, 1586, 1673, 1865, 1866.
CIPY records. — RN, PB, PE, and SP.
Notes. — From beaches and Paraíba do Norte River estuary. Some specimens found with commensal crustaceans in their ambulacral groove.

Order Spinulosida Perrier, 1884
Family Echinasteridae Verrill, 1867
Echinaster (Othilia) brasiliensis Müller & Troschel, 1842
Voucher numbers. — UFPB.ECH.138, 718, 872, 1183, 1426, 1465.
CIPY records. — RN, PB, and BA.
Notes. — From shallow reefs and hypersaline mangrove.

Echinaster (Othilia) echinophorus (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.139, 568, 570, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 870, 871, 873, 1172, 1184, 1234, 1240, 1463, 1464, 1466, 1903, 1904, 1905, 1911, 1912, 1913, 1914.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, and hypersaline mangrove. Intertidal to 10 m depth.

Order Valvatida Perrier, 1884
Family Asterinidae Gray, 1840
Asterinides folium (Lütken, 1860)
Voucher number. — UFPB.ECH.572.
CIPY record. — PB.
Notes. — From 10 m depth, associated with the Rhodophyta *Lithothamnion* sp.

Family Ophidiasteridae Verrill, 1870
Linckia guildingi Gray, 1840
Voucher numbers. — UFB.ECH.1159, 1160, 1161, 1235, 1236, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248,

1249, 1250, 1479, 1502.
CIPY record. — PB.
Notes. — From shallow reefs and Project Algas-PB, intertidal to 30 m depth.

Family Oreasteridae Fisher, 1908
Oreaster reticulatus (Linnaeus, 1758)
Voucher numbers. — UFPB.ECH. 1251, 1252, 1253, 1254, 1255, 1429, 1430, 1574, 1575, 1576, 1577, 1578, 1579, 1581, 1588, 1590, 1593, 1594, 1871, 1872, 1873.
CIPY records. — CE, PB, and PE.
Notes. — From Project Algas-PB, Geomar XXIV, and rhodolith beds, 6 to 35 m depth.

Class Ophiuroidea Gray, 1840
Order Euryalida Lamarck, 1816
Family Gorgonocephalidae Ljungman, 1867
Astrophyton muricatum (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.1975, 2036.
CIPY records. — RN and BA.
Notes. — From continental shelf of RN, between 120 to 130 m depth, and Abrolhos Archipelago.

Astrocyclus caecilia (Lütken, 1856)
Voucher number. — UFPB.ECH.2161.
CIPY record. — RN.
Notes. — From continental shelf between 120 to 130 m depth.

Asteroporpa (Asteroporpa) annulata Örsted & Lütken in Lütken, 1856
Voucher number. — UFPB.ECH.1823.
CIPY record. — RN.
Notes. — From continental shelf, 100 m depth.

Order Ophiacanthida O'Hara, Hugall, Thuy, Stöhr & Martynov, 2017
Family Ophiacanthidae Ljungman, 1867
Ophiacantha cosmica Lyman, 1878
Vouches numbers. — UFPB.ECH.1835, 1836.
CIPY record. — SP.
Notes. — From REVIZEE-Score Sul, 380 to 808 m depth.

Ophiopaepale goesiana Ljungman, 1872 (*incertae sedis*)
Voucher number. — UFPB.ECH.2160.
CIPY record. — RN.
Notes. — From Potiguar Basin, about 100 m depth.

Family Ophiomyxidae Ljungman, 1867
Ophiomyxa flaccida (Say, 1825)
Voucher numbers. — UFPB.ECH.064, 065, 071, 072, 244, 291, 371, 393, 400, 442, 445, 448, 449, 450, 455, 498, 607, 608, 1130, 1131, 1142, 1782, 1869.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, Abrolhos Archipelago, and Project Algas-PB. Intertidal to 33 m depth. Some specimens associated with phytal of the algae *Ulva lactuca* Linnaeus, 1753 and *Hypnea musciformis* (Wulfen) J.V. Lamouroux, 1813.

Family Ophiocomidae Ljungman, 1867
Ophiocoma echinata (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.216, 228, 255, 256, 257, 260, 264, 265, 266, 267, 268, 290, 294, 338, 339, 348, 353, 370, 394, 406, 409, 440, 441, 443, 447, 461, 462, 463, 483, 493, 507, 509, 519, 527, 529, 542, 543, 588, 601, 602, 603, 604, 605, 606, 626, 627, 628, 629, 773, 928, 929, 1031, 1215, 1381, 1382, 1413, 1414, 1415, 1416, 1612, 1886, 2235.
CIPY records. — RN, PB, and BA.
Notes. — From shallow reefs, rhodolith beds, Abrolhos Archipelago, and Project Algas-PB. Intertidal to 35 m depth.

Ophiomastix wendtii (Müller & Troschel, 1842)
Voucher numbers. — UFPB.ECH.397, 451, 467, 508, 549, 554, 630, 672, 679, 689, 690, 772, 1392.
CIPY record. — PB.
Notes. — From Project Algas-PB and Geomar XXIV, 14 to 34 m depth.

Ophiocomella ophiactoides (H.L. Clark, 1900)
Voucher numbers. — UFPB.ECH.034, 035, 036, 037, 038, 040, 046, 1645, 1647, 1688, 1693, 1696, 1700, 1796, 1797, 1801, 2079, 2086, 2186, 2242, 2254, 2255.
CIPY records. — PE, PB, BA.
Notes. — From shallow reefs, Fernando de Noronha, and Abrolhos Archipelago. Intertidal to 9 m depth. Some specimens associated with phytal of *H. opuntia*.

Family Ophiodermatidae Ljungman, 1867
Ophioderma appressum (Say, 1825)
Voucher numbers. — UFPB.ECH.041, 117, 120, 126, 129, 131, 172, 220, 296, 303, 306, 309, 328, 336, 341, 356, 357, 362, 365, 375, 377, 453, 457, 458, 459, 464, 472, 485, 494, 505, 511, 522, 530, 532, 579, 583, 587, 614, 665, 673, 674, 675, 676, 677, 678, 691, 692, 693,

694, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1012, 1019, 1134, 1156, 1177, 1187, 1199, 1204, 1209, 1210, 1211, 1261, 1262, 1263, 1267, 1283, 1284, 1290, 1339, 1340, 1341, 1346, 1347, 1354, 1367, 1369, 1389, 1390, 1391, 1418, 1420, 1434, 1444, 1597, 1607, 1614, 1783, 1804, 1806, 1858, 1882, 1888, 2002, 2075, 2236, 2261, 2278.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, Abrolhos Archipelago, Project Algas-PB, and Geomar XXIV. Intertidal to 35 m depth.

Ophioderma besnardi Tommasi, 1970
Voucher numbers. — UFPB.ECH.282.
CIPY records. — PB and RN.
Notes. — From continental shelf, between 120 to 130 m depth, Project Algas-PB.

Ophioderma cinereum Müller & Troschel, 1842
Voucher numbers. — UFPB.ECH.114, 115, 116, 119, 121, 122, 123, 124, 128, 132, 133, 134, 135, 136, 254, 258, 333, 337, 346, 347, 361, 363, 380, 386, 391, 411, 412, 413, 414, 420, 444, 452, 454, 479, 500, 503, 525, 551, 577, 580, 585, 586, 594, 595, 596, 598, 609, 611, 612, 613, 631, 664, 670, 682, 695, 750, 751, 752, 753, 754, 755, 756, 831, 832, 833, 834, 835, 836, 996, 1010, 1011, 1133, 1140, 1144, 1258, 1259, 1264, 1386, 1387, 1388, 1411, 1419, 1433, 1443, 1462, 1467, 1507, 1598, 1805, 1807, 1859, 1860, 1868, 1885, 1889, 1932, 2237.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow reefs, Abrolhos Archipelago, Project Algas-PB, and Geomar XXIV. Intertidal to 35 m depth.

Ophioderma januarii Lütken, 1856
Vouches numbers. — UFPB.ECH.272, 294, 332, 500, 502, 505, 554, 561, 593, 837, 1132, 1194, 1260, 1686, 1741, 1743, 1744, 1898.
CIPY records. — RN and PB.
Notes. — From shallow reefs, hypersaline mangrove, and Project Algas-PB. Intertidal to 26 m depth. Some specimens found associated with algae.

Order Amphilepidida O'Hara, Hugall, Thuy, Stöhr & Martynov, 2017
Family Amphiuridae Ljungman, 1867

Amphiodia planispina (von Martens, 1867)
Voucher numbers. — UFPB.ECH.227, 248, 379, 685, 992, 1033, 1090, 1122, 1669, 2179, 2181.
CIPY record. — PB.
Notes. — From seagrass, rhodolith beds, and Project Algas-PB. Intertidal to 27 m depth.

Amphiodia riisei (Lütken, 1859)
Voucher numbers. — UFPB.ECH.991, 1190, 1196.
CIPY records. — RN and PB.
Notes. — From hypersaline mangroves and Project Algas-PB, intertidal to 16 m depth.

***Amphiodia* sp.**
Voucher numbers. — UFPB.ECH.223, 1699.
CIPY record. — PB.
Notes. — From rhodolith beds, 10 m depth.

Amphioplus camamuensis Manso, 2004
Voucher number. — UFPB.ECH.2158.
CIPY record. — BA.
Notes. — From Camamu Bay. Holotype.

Amphioplus lucyae Tommasi, 1971
Voucher number. — UFPB.ECH.1833, 1834.
CIPY record. — SP.
Notes. — From São Sebastião and Ubatuba, 25 to 30 m depth.

Amphipholis januarii Ljungman, 1866
Voucher numbers. — UFPB.ECH.050, 051, 053, 057, 066, 112, 170, 217, 224, 232, 234, 237, 238, 269, 280, 374, 376, 382, 432, 471, 492, 496, 545, 576, 662, 684, 698, 859, 861, 993, 1032, 1088, 1089, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1136, 1150, 1157, 1176, 1288, 1351, 1373, 1375, 1377, 1394, 1408, 1451, 1471, 1492, 1496, 1522, 1535, 1544, 1549, 1601, 1603, 1604, 1606, 1652, 1662, 1663, 1773, 1781, 1784, 1800, 1900, 1934, 1936, 1938, 2008, 2081, 2191, 2196, 2197, 2217, 2248, 2249, 2252, 2253, 2256, 2257, 2258, 2265, 2276, 2280.
CIPY records. — MA, RN, PB, and BA.
Notes. — From shallow reefs, hypersaline mangrove, rhodolith beds, Abrolhos Archipelago, Port of Cabedelo, shipwreck of Queimado, and Project Algas-PB. Intertidal to 27 m depth. Some specimens associated with the phytal of *Gracilaria cervicornis* (Turner) J. Agardh, 1852, *Halimeda* sp., *H. opuntia*, *Ulva* sp., *Lithothamnion* sp., with the coral *S. stellata* and sponges.

Amphipholis squamata (Delle Chiaje, 1828)
Voucher numbers. — UFPB.ECH.043, 048, 055, 056, 059, 063, 069, 070, 077, 107, 225, 246, 251, 262, 324, 326, 343, 473, 699, 700, 701, 860, 941, 1115, 1116, 1117, 1118, 1119, 1120, 1151, 1171, 1178, 1191, 1193, 1200, 1201, 1203, 1289, 1353, 1355, 1356, 1357, 1378, 1380, 1393, 1399, 1400, 1401, 1409, 1410, 1442, 1448, 1454, 1490, 1494, 1495, 1522, 1525, 1530, 1536, 1537, 1540, 1542, 1543, 1547, 1600, 1651, 1667, 1676, 1677, 1692, 1694, 1697, 1748, 1749, 1750, 1774, 1779, 1794, 1795, 1799, 1808, 1899, 1933, 2006, 2009, 2074, 2082, 2083, 2185, 2190, 2193, 2199, 2200, 2203, 2204, 2214, 2218, 2222, 2233, 2260, 2275, 2281.
CIPY records. — RN, PB, AL, BA, and SP.
Notes. — From shallow reefs, rhodolith beds, rocky shore, hypersaline mangrove, and Project Algas-PB. Intertidal to 26 m depth. Some specimens associated with the phytal of *Halimeda* sp., *H. opuntia*, *Crassiphycus caudatus* (J. Agardh) Gurgel, J.N. Norris & Fredericq 2018, *Caulerpa racemosa* (Forsskål) J. Agardh, 1873, *G. cervicornis*, *Padina gymnospora* (Kützing) Sonder, 1871, *Padina* sp., *Lobophora* sp., *Dictyota* sp., *Sargassum polyceratium* Montagne, 1837, *Sargassum* sp., *Lithothamnion* sp., with the scleractinian corals *S. stellata*, and *M. harttii*, the soft coral *Z. sociatus*, and sponges.

***Amphipholis* sp.**
Voucher numbers. — UFPB.ECH.171, 226.
CIPY record. — PB.
Notes. — From rhodolith beds.

Amphiura joubini Koehler, 1912
Voucher numbers. — UFPB.ECH.1940, 1941.
CIPY record. — SP.
Notes. — From BIOTA FAPESP, 36 to 40 m depth.

Amphiura kinbergi Ljungman, 1872
Vouches number. — UFPB.ECH.2245.
CIPY record. — BA.
Notes. — From shallow reefs.

Amphiura stimpsonii Lütken, 1859
Voucher numbers. — UFPB.ECH.042, 094, 103, 366, 774, 775, 990, 1407.
CIPY records. — PB and BA.
Notes. — From shallow reefs, Abrolhos Archipelago, and Project Algas-PB. Intertidal to 18 m depth. Some specimens found associated with the phytal of *H. opuntia* and with the corals *M. harttii* and *M. hispida*.

***Amphiura* sp.**
Voucher number. — UFPB.ECH.242.
CIPY record. — PB.
Notes. — From rhodolith beds.

Microphiopholis atra (Stimpson, 1852)
Voucher numbers. — UFPB.ECH.1195, 1901, 2183, 2189, 2282.
CIPY records. — RN and PB.
Notes. — From rhodolith beds, Mamanguape River estuary, and hypersaline mangrove. Intertidal to 10 m depth.

Ophiocnida scabriuscula (Lütken, 1859)
Voucher numbers. — UFPB.ECH.174, 231, 298, 334, 335, 384, 389, 390, 396, 994, 1100, 1101, 1102, 1103, 1137, 1149, 1153, 1175, 1185, 1188, 1383, 1421, 1437, 1445, 1469, 1506, 1518, 1616, 1661, 1698, 1780, 1897, 2003, 2005, 2007.
CIPY records. — RN and PB.
Notes. — From shallow reefs, rhodolith beds, and Project Algas-PB. Intertidal to 18 m depth.

Ophiophragmus pulcher H.L. Clark, 1918
Voucher number. — UFPB.ECH.2231.
CIPY record. — PB.
Notes. — From rhodolith beds.

Ophiophragmus luetkeni (Ljungman, 1872)
Voucher number. — UFPB.ECH.2279.
CIPY record. — PB.
Notes. — From sandbanks.

Ophiostigma isocanthum (Say, 1825)
Voucher numbers. — UFPB.ECH.173, 218, 221, 233, 321, 322, 410, 415, 533, 567, 995, 1086, 1087, 1163, 1164, 1343, 1352, 1605, 1664, 1668, 1687, 1753, 2182.
CIPY records. — RN and PB.
Notes. — From rhodolith beds, hypersaline mangroves, and Project Algas-PB. Intertidal to 34 m depth. Some specimens associated with algae.

Family Ophiopsilidae Matsumoto, 1915
Ophiopsila hartmeyeri Koehler, 1913
Voucher numbers. — UFPB.ECH.304, 323, 325, 369, 392, 407, 408, 417, 419, 426, 429, 456, 460, 466, 468, 482, 495, 521, 531, 561, 589, 597, 633, 652, 666, 671, 767, 768, 769, 770, 771, 802, 803, 804, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 1025, 1026, 1027,

1028, 1029, 1030, 1096, 1097, 1098, 1099, 1417.
CIPY record. — PB.
Notes. — From Project Algas-PB, 12 to 30 m depth.

Family Hemieuryalidae Verrill, 1899
Hemieuryale pustulata v. Martens, 1867
Vouches numbers. — UFPB.ECH.2159, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177.
CIPY records. — RN.
Notes. — Associated with the octocoral *N. guadalupensis*, from 10 m depth.

Ophioplocus januarii (Lütken, 1856)
Voucher numbers. — UFPB.ECH.1824.
CIPY record. — SP.
Notes. — From Projeto Integrado, 48 m depth.

Family Ophiactidae Matsumoto, 1915
Ophiactis brasiliensis Manso, 1988
Voucher number. — UFPB.ECH.2241.
CIPY record. — BA.
Notes. — From shallow reefs.

Ophiactis lymani Ljungman, 1872
Voucher numbers. — UFPB.ECH.058, 061, 073, 074, 075, 079, 080, 081, 084, 095, 096, 101, 102, 105, 106, 109, 113, 283, 284, 302, 372, 1128, 1129, 1186, 1280, 1404, 1438, 1452, 1493, 1539, 1775, 2085, 2180, 2188, 2215, 2219, 2221.
CIPY records. — MA, PB, and RJ.
Notes. — From shallow reefs, rocky shore, and rhodolith beds. Intertidal to 18 m depth. Some individuals associated with the phytals of *H. opuntia*, *C. recemosa*, *Sargassum vulgare* C. Agardh, 1820, *S. polyceratium*, *Padina* sp., *Lithothamnion* sp., the scleractinian corals *M. harttii*, *M. hispida*, *S. stellata*, and ascidians.

Ophiactis quinqueradia Ljungman, 1872
Voucher numbers. — UFPB.ECH.253, 261, 285, 286, 287, 288, 289, 349, 423, 425, 430, 476, 478, 534, 617, 618, 619, 620, 621, 622, 651, 659, 661, 683, 1021, 1022, 1023, 1024, 1091, 1092, 1093, 1094, 1095, 1281, 1370, 1374, 1436, 1531, 1803.
CIPY records. — RN, PB, PE, BA, and SP.
Notes. — From shallow reefs, Abrolhos Archipelago, and Project Algas-PB. Intertidal to 39 m depth. Some individuals found inside sponges.

Ophiactis savignyi (Müller & Troschel, 1842)
Voucher numbers. — UFPB.ECH.039, 044, 045, 047, 052, 054, 060, 062, 067, 068, 076, 082, 083, 085, 086, 087, 088, 090, 091, 092, 093, 097, 099, 100, 108, 110, 111, 137, 240, 281, 297, 301, 395, 418, 422, 428, 1123, 1124, 1125, 1126, 1127, 1138, 1147, 1152, 1154, 1179, 1192, 1198, 1266, 1279, 1398, 1402, 1403, 1431, 1441, 1447, 1453, 1470, 1489, 1508, 1527, 1529, 1538, 1541, 1545, 1546, 1548, 1609, 1691, 1695, 1747, 1751, 1752, 1772, 1778, 1792, 1798, 1863, 1891, 1895, 1935, 1937, 2011, 2084, 2178, 2194, 2195, 2216, 2220, 2238, 2250, 2251, 2277.
CIPY records. — MA, CE, RN, PB, AL, and SP.
Notes. — From shallow reefs, hypersaline mangrove, rhodolith beds, shipwreckes of Queimado and Alvarenga. Intertidal to 12 m depth. Some individual associated with the phytal of *Halimeda* sp., *H. opuntia*, *C. racemosa*, *S. polyceratium*, *S. vulgare*, *G. cervicornis*, *Lithothamnion* sp., the corals *M. harttii*, *M. hispida*, and *S. stellata*, and inside sponges.

Hemipholis cordifera (Bosc, 1802)
Voucher numbers. — UFPB.ECH.1826, 1827, 1926.
CIPY records. — RN and SP.
Notes. — From hypersaline mangrove and Projeto Integrado. Intertidal to 19 m depth.

Family Ophiotrichidae Ljungman, 1867
Ophiothix (Ophiothrix) angulata (Say, 1825)
Voucher numbers. — UFPB.ECH.078, 098, 104, 215, 219, 222, 230, 235, 239, 245, 250, 259, 263, 307, 345, 360, 364, 367, 368, 373, 388, 399, 401, 402, 403, 404, 405, 416, 421, 424, 427, 446, 470, 474, 502, 506, 514, 515, 516, 535, 536, 537, 538, 539, 540, 541, 546, 548, 552, 555, 556, 558, 565, 566, 575, 578, 581, 590, 593, 600, 623, 624, 632, 667, 730, 731, 732, 733, 734, 735, 736, 737, 738, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 805, 806, 807, 808, 809, 810, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1104, 1105, 1106, 1170, 1174, 1197, 1265, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1345, 1348, 1358, 1365, 1371, 1376, 1385, 1397, 1405, 1412, 1422, 1423, 1424, 1425, 1435, 1440, 1446, 1450, 1488, 1491, 1509, 1510, 1520, 1521, 1526, 1528,

1532, 1533, 1596, 1602, 1613, 1666, 1685, 1742, 1745, 1746, 1754, 1809, 1862, 1864, 1883, 1884, 1890, 2077, 2078, 2080, 2192, 2211, 2234, 2284.
CIPY records. — MA, PI, CE, RN, PB, PE, AL, BA, and SP.
Notes. — From shallow reefs, rocky shore, rhodolith beds, hypersaline mangrove, Abrolhos Archipelago, shipwreck of Queimado, Project Algas-PB, and Geomar XXIV. Intertidal to 80 m depth. Some individuals associated with algae, sponges, the sea worms of the family Polynoidae, the corals *M. harttii*, *S. stellata* and with parasitic molluscs.

Ophiothrix (Ophiothrix) rathbuni Ludwig, 1882
Voucher numbers. — UFPB.ECH.1282, 1837, 1838.
CIPY records. — BA and SP.
Notes. — From Abrolhos Archipelago, the projects Biota-FAPESP and REVIZEE-Score Sul, 40 to 380 m depth.

Family Ophionereididae Ljungman, 1867
Ophionereis dolabriformis John & A.M. Clark, 1954
Voucher numbers. — UFPB.ECH.748, 749, 912, 913, 1044, 1045, 1046, 1082, 1083, 1338.
CIPY record. — PB.
Notes. — From Project Algas-PB, 14 to 35 m depth.

Ophionereis reticulata (Say, 1825)
Voucher numbers. — UFPB.ECH.125, 130, 214, 229, 236, 243, 247, 292, 295, 299, 305, 308, 327, 329, 342, 344, 358, 359, 378, 381, 383, 385, 387, 398, 431, 465, 475, 480, 484, 512, 513, 518, 520, 523, 526, 544, 550, 557, 559, 582, 634, 638, 640, 641, 646, 647, 648, 654, 660, 669, 681, 739, 740, 741, 742, 743, 862, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 1016, 1017, 1047, 1048, 1049, 1075, 1076, 1077, 1078, 1079, 1080, 1135, 1139, 1143, 1145, 1155, 1168, 1169, 1173, 1189, 1257, 1276, 1277, 1278, 1286, 1287, 1349, 1350, 1359, 1366, 1368, 1384, 1395, 1396, 1406, 1432, 1439, 1449, 1483, 1484, 1485, 1486, 1487, 1505, 1511, 1519, 1595, 1610, 1650, 1657, 1660, 1665, 1689, 1690, 1791, 1802, 1844, 1861, 1870, 1887, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 2000, 2001, 2004, 2076, 2184, 2187, 2198, 2283.
CIPY records. — PI, CE, RN, PB, PE, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, Abrolhos Archipelago, Project Algas-PB, and Geomar XXIV. Intertidal to 60 m depth. Some specimens associated with the algae *Lithothamnion* sp. and the sea worm *Hesione picta* Müller in Grube, 1858.

Ophionereis squamulosa Koehler, 1914
Voucher numbers. — UFPB.ECH.175, 320, 340, 469, 481, 510, 517, 524, 528, 547, 563, 564, 584, 591, 599, 625, 635, 636, 637, 639, 642, 643, 644, 645, 649, 650, 680, 686, 687, 688, 696, 745, 746, 747, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1081, 1084, 1085, 1939, 2243.
CIPY records. — PB and BA.
Notes. — From shallow reef, rhodolith beds and Project Algas-PB. Intertidal to 30 m depth.

Family Ophiolepididae Ljungman, 1867 (restricted)
Ophiolepis impressa Lütken, 1859
Voucher numbers. — UFPB.ECH.127, 486, 487, 488, 490, 491, 497, 657, 1881.
CIPY records. — PB and AL.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 33 m depth.

Ophiolepis paucispina (Say, 1825)
Voucher numbers. — UFPB.ECH.489, 562, 1372, 2239.
CIPY records. — PB and BA.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 33 m depth.

Order Ophiurida Müller & Troschel, 1840 sensu O'Hara *et al.*, 2017
Family Astrophiuridae Sladen, 1879
Ophiomisidium tommasi Borges, Monteiro & Amaral, 2006
Voucher numbers. — UFPB.ECH.1831, 1832.
CIPY record. — SP.
Notes. — From Projeto Integrado and REVIZEE-Score Sul, 510 to 511 m depth.

Family Ophiuridae Müller & Troschel, 1840
Ophiura clemens (Koehler, 1904)
Voucher number. — UFPB.ECH.1830.
CIPY record. — SP.
Notes. — From REVIZEE-Score Sul, 530 m depth.

Ophiura ljungmani (Lyman, 1878)
Voucher numbers. — UFPB.ECH.1828, 1829.
CIPY record. — SP.
Notes. — From Projeto Integrado and REVIZEE-Score Sul, 505 to 530 m depth.

Family Ophiomusaidae O'Hara, Stöhr, Hugall, Thuy & Martynov, 2018
Ophiomusa acufera (Lyman, 1875)
Voucher number. — UFPB.ECH.1825.
CIPY record. — SP.
Notes. — From REVIZEE-Score Sul, 150 m depth.

Class Echinoidea Leske, 1778
Order Cidaroida Claus, 1880
Family Cidaridae Gray, 1825
Eucidaris tribuloides (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.1337, 1362, 1620, 1621, 1624, 1625, 1626, 1627, 1628, 1636, 1638, 1640, 1643, 1727, 1728, 1732, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1755, 1758, 1757, 1758, 1759, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1777, 1785, 1786, 1787, 1788, 1789, 1790, 1810, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1902, 1917, 2267.
CIPY records. — PB, PE, AL, and BA.
Notes. — From shallow reefs, Fernando de Noronha, Project Algas-PB, and Geomar XXIV. Intertidal to 38 m depth.

Order Diadematoida Duncan, 1889
Family Diadematidae Gray, 1855
Centrostephanus longispinus rubicingulus H.L. Clark, 1921
Voucher numbers. — UFPB.ECH.2290, 2291, 2292.
CIPY record. — RN.
Notes. — From Potiguar Basin, 40 to 108 m depth.

Diadema ascensionis Mortensen, 1909
Voucher numbers. — UFPB.ECH.1910, 1922.
CIPY record. — AL.
Notes. — From shallow reefs.

Order Camarodonta Jackson, 1912
Family Echinometridae Gray, 1855
Echinometra lucunter (Linnaeus, 1758)
Voucher numbers. — UFPB.ECH.001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 015, 016, 021, 022, 023, 025, 026, 027, 028, 029, 030, 031, 033, 351, 352, 354, 355, 573, 702, 777, 1018, 1020, 1146, 1148, 1181, 1182, 1212, 1315, 1316, 1317, 1318, 1319, 1320, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1455, 1456, 1457, 1460, 1472, 1473, 1475, 1476, 1477, 1482, 1512, 1513, 1514, 1515, 1611, 1634, 1642, 1649, 1653, 1654, 1655, 1656, 1658, 1659, 1670, 1674, 1675, 1701, 1702, 1729, 1730, 1731, 1733, 1822, 1843, 1880, 1906, 1909, 2262, 2271, 2285.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, and Abrolhos Archipelago. Intertidal to 10 m depth. Some individuals associated with phytal of *H. opuntia* and *C. racemosa*.

Family Toxopneustidae Troschel, 1872
Lytechinus variegatus (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.007, 014, 017, 018, 019, 020, 024, 032, 574, 1158, 1321, 1363, 1364, 1461, 1552, 1629, 1631, 1639, 1644, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1760, 1776, 1811, 1812, 2269.
CIPY records. — PE, PB, AL, and BA.
Notes. — From shallow reefs, rhodolith beds, and Project Algas-PB. Intertidal to 35 m depth.

Tripneustes ventricosus (Lamarck, 1816)
Voucher numbers. — UFPB.ECH.1361, 1630, 1635, 1637, 1641, 1722, 1723, 1724, 1725, 1726, 1916, 2270.
CIPY records. — PB, AL, and BA.
Notes. — From shallow reefs and Project Algas-PB. Intertidal to 34 m depth.

Order Clypeasteroida A. Agassiz, 1872
Family Mellitidae Stefanini, 1912
Encope emarginata (Leske, 1778)
Voucher numbers. — UFPB.ECH.615, 865, 1214, 1291, 1296, 1298, 1299, 1300, 1301, 1303, 1304, 1305, 1306, 1308, 1309, 1310, 1311, 1312, 1313, 1360, 1907, 1908, 2286.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow water of sandy beaches, hypersaline mangroves, and Port of Cabedelo (PB). Some individuals associated with decapods.

Leodia sexiesperforata (Leske, 1778)
Voucher numbers. — UFPB.ECH.1013, 1165, 1297, 1302, 1307, 1893, 1915, 1921.
CIPY records. — RN, PB, AL, and BA.
Notes. — From shallow water of sandy beaches and Port of Cabedelo (PB). Some individuals associated with decapods.

Mellita* aff. *quinquiesperforata (Leske, 1778)
Voucher numbers. — UFPB.ECH.350, 616, 1015, 1166,

1167, 1205, 1206, 1207, 1208, 1213, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1285, 1292, 1293, 1294, 1295, 1314, 1458, 1474, 1892, 1894, 1918, 1920, 1929, 1930, 1931, 1942, 2287.
CIPY records. — CE, RN, PB, AL, SE, and SP.
Notes. — From shallow water of sandy beaches and hypersaline mangroves. Some individuals associated with decapods.

Family Fibulariidae Gray, 1855
Echinocyamus grandiporus Mortensen, 1907
Voucher numbers. — UFPB.ECH.1974.
CIPY record. — CE.
Notes. — From Canopus bank.

Order Echinoneoida H.L. Clark, 1925
Family Echinoneidae L. Agassiz & Desor, 1847
Echinoneus cyclostomus Leske, 1778
Voucher numbers. — UFPB.ECH.1973.
CIPY record. — CE.
Notes. — From Canopus bank.

Class Holothuroidea (Blainville, 1834)
Order Apodida Brandt, 1835
Family Chiridotidae Östergren, 1898
Chiridota rotifera (Pourtalès, 1851)
Voucher numbers. — UFPB.ECH176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 330, 436, 853, 1068, 1220, 1225, 1468, 1481, 1497, 1498, 1599, 1617, 1618, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1955, 2039, 2045, 2054, 2123, 2126, 2127, 2128, 2129, 2247, 2263, 2288.
CIPY records. — CE, RN, PB, PE, AL, BA, and ES.
Notes. — From shallow reefs, hypersaline mangroves, rhodolith beds, and Project Algas-PB. Intertidal to 15 m depth. Some individuals associated with phytal and under rocks.

Family Synaptidae Burmeister, 1837
Synaptula hydriformis (Lesueur, 1824)
Voucher numbers. — UFPB.ECH.156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 852, 1069, 1070, 1501, 1554, 1615, 1681, 1896, 1956, 1957, 1958, 2064.
CIPY records. — RN, PB, and RJ.
Notes. — From shallow reefs and hypersaline mangroves. Some individuals associated with phytal of *Sargassum* sp.

Protankyra ramiurna Heding, 1928
Voucher numbers. — UFPB.ECH.2125
CIPY record. — PB.
Notes. — From Port of Cabedelo, 8.4 m depth.

Order Dendrochirotida Grube, 1840
Family Cucumariidae Ludwig, 1894
Ocnus braziliensis (Verrill, 1868)
Voucher numbers. — UFPB.ECH.1063, 1619.
CIPY records. — RN and PB.
Notes. — From shallow reefs and hypersaline mangroves.

Parathyone suspecta (Ludwig, 1875)
Voucher numbers. — UFPB.ECH.438, 867, 1061, 1216, 1224, 1499, 1550, 1619, 1679, 1960, 1961, 2012, 2022.
CIPY records. — RN, PB, and BA.
Notes. — From shallow reefs, hypersaline mangroves, rhodolith beds, and Abrolhos Archipelago. Intertidal to 6 m depth. Some specimens associated with phytal of *Sargassum* sp.

Thyonidium seguroensis (Deichmann, 1930)
Voucher numbers. — UFPB.ECH.874, 1217, 1551, 1553, 1680, 1988, 1997, 1999, 2017, 2040, 2046, 2047, 2050, 2051, 2055, 2060, 2062, 2065, 2066, 2100, 2101, 2102, 2103, 2104, 2224, 2227.
CIPY records. — PB, PE, AL and BA.
Notes. — From shallow reefs and rhodolith beds. Intertidal to 15 m depth. Some individuals associated with phytal of *Lobophora variegata* (J.V. Lamouroux) Womersley ex E.C. Oliveira, 1977, *Sargassum* sp., *Gracilaria* sp. and *Hypnea* sp.

Trachythyone crassipeda Cherbonnier, 1961
Voucher numbers. — UFPB.ECH.2026, 2032, 2093.
CIPY record. — BA.
Notes. — From shallow reefs.

Family Phyllophoridae Östergren, 1907
Pentamera paraibanensis Prata & Christoffersen, 2016
Voucher numbers. — UFPB.ECH.140, 141, 143, 145, 148, 149, 150, 153, 204, 205, 857, 858, 1683, 1684, 2030, 2031, 2033, 2037, 2038, 2048, 2049, 2052, 2053, 2057, 2058, 2059, 2061, 2068, 2072, 2087, 2088, 2089, 2229, 2230.
CIPY record. — PB.
Notes. — From shallow reefs and rhodolith beds. Intertidal 20 m depth. Some individuals associated with the phytal of *Halimeda* sp. and *Hypnea* sp. Holotype

(UFPB.ECH.2229) and paratypes (UFPB.ECH.2048, 2058, 2061, 2089, 2230).

Pentamera pulcherrima Ayres, 1852
Voucher numbers. — UFPB.ECH.2147, 2148.
CIPY record. — PB.
Notes. — From rhodolith beds.

Stolus cognatus (Lampert, 1885)
Voucher numbers. — UFPB.ECH.155, 854, 1060, 1065, 1066, 1073, 1074, 1219, 1503, 1944, 1945, 1946, 1954, 1991, 2014, 2035, 2056, 2091, 2092, 2273.
CIPY records. — RN, PB, and BA.
Notes. — From shallow reefs and rhodolith beds. Intertidal to 15 m depth.

Thyone brasiliana Prata, Manso & Christoffersen, 2020
Voucher numbers. — UFPB.ECH.2121, 2122.
CIPY record. — PB.
Notes. — From rhodolith beds, 10 m depth. Holotype (UFPB.ECH.2121) and paratype (UFPB.ECH.2122).

Thyone crassidisca Pawson & Miller, 1981
Voucher numbers. — UFPB.ECH. 213, 2021, 2115.
CIPY record. — PB.
Notes. — From rhodolith beds.

Thyone pawsoni Tommasi, 1972
Voucher numbers. — UFPB.ECH.1992, 2119, 2266.
CIPY record. — PB.
Notes. — From shallow reefs and rhodolith beds. Intertidal to 10 m depth.

Thyone pseudofusus Deichmann, 1930
Voucher numbers. — UFPB.ECH.2114, 2116, 2117, 2118.
CIPY record. — PB.
Notes. — From rhodolith beds, 10 to 15 m depth.

Family Psolidae Burmeister, 1837
Lissothuria braziliensis (Théel, 1886)
Voucher numbers. — UFPB.ECH.1292, 2274.
CIPY record. — PB.
Notes. — From shallow reefs. Some individuals under rocks and associated with rhodoliths.

Family Sclerodactylidae Panning, 1949
Coronatum baiensis Martins & Souto in Martins, Souto & Menegola, 2012
Voucher numbers. — UFPB.ECH.2151, 2152, 2153, 2154, 2155, 2156, 2157.
CIPY records. — PB and BA.
Notes. — From shallow reefs and rhodolith beds. Intertidal to 10 m depth.

Euthyonidiella occidentalis (Ludwig, 1875)
Voucher numbers. — UFPB.ECH.152, 433, 434, 435, 855, 886, 1064, 1067, 1218, 1221, 1504, 1608, 1963, 1994, 1995, 1996, 2015, 2018, 2020, 2023, 2017, 2028, 2029, 2041, 2063, 2067, 2069, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2225, 2264.
CIPY records. — RN, PB, PE, and BA.
Notes. — From shallow reefs, rhodolith beds, and Abrolhos Archipelago. Intertidal to 20 m depth. Some individual collected in phytal of *Gracilaria* sp., and between and under rocks.

Euthyonidiella trita (Sluiter, 1910)
Voucher number. — UFPB.ECH.2124.
CIPY record. — PB.
Notes. — From rhodolith beds.

Havelockia nietae Prata, Manso & Christoffersen, 2020
Vouches number. — UFPB.ECH.2120.
CIPY record. — RN.
Notes. — From hypersaline mangroves. Holotype.

Pseudothyone belli (Ludwig, 1886)
Voucher numbers. — UFPB.ECH.144, 146, 1959, 1990, 2016, 2043, 2044, 2094, 2095, 2096, 2097, 2098, 2099, 2149, 2150.
CIPY record. — PB.
Notes. — From shallow reefs and rhodolith beds. Intertidal to 15 m depth. Some individuals associated with phytal of *H. opuntia*.

Order Holothuriida Miller, Kerr, Paulay, Reich, Wilson, Carvajal & Rouse, 2017
Family Holothuridae Burmeister, 1837
Holothuria (Cystipus) pseudofossor Deichmann, 1930
Voucher numbers. — UFPB.ECH.2070
CIPY record. — PB.
Notes. — From Project Algas-PB, 30 m depth.

Holothuria (Halodeima) grisea Selenka, 1867
Voucher numbers. — UFPB.ECH.206, 207, 208, 209, 210, 211, 212, 213, 270, 272, 273, 274, 275, 276, 277, 278, 279, 310, 311, 312, 313, 314, 315, 316, 317, 318,

319, 439, 776, 1059, 1072, 1141, 1222, 1223, 1226, 1459, 1516, 1517, 1556, 1558, 1793, 1962, 1985, 1986, 2019, 2130, 2133, 2134, 2138, 2139, 2141, 2145, 2272.
CIPY records. — PI, CE, RN, PB, PE, AL, BA, and RJ.
Notes. — From shallow reefs and rocky shores.

Holothuria (Holothuria) dakarensis Panning, 1939
Voucher number. — UFPB.ECH.2158.
CIPY record. — RN.
Notes. — From hypersaline mangroves.

Holothuria (Semperothuria) surinamensis Ludwig, 1875
Voucher numbers. — UFPB.ECH.1884, 1984, 2071.
CIPY record. — AL.
Notes. — From shallow reefs.

Holothuria (Theelothuria) princeps Selenka, 1867
Voucher numbers. — UFPB.ECH.1557.
CIPY record. — AL.
Notes. — From shallow reefs.

Holothuria (Thymiosycia) arenicola Semper, 1868
Voucher numbers. — UFPB.ECH.697, 1062, 1480, 1928, 1983, 2131, 2132, 2135, 2136, 2140, 2142, 2143, 2246.
CIPY records. — RN, PB, PE, AL, and BA.
Notes. — From shallow reefs and hypersaline mangroves. Individuals collected under rocks and burrowed in sand/mud bottoms.

Order Synallactida Miller, Kerr, Paulay, Reich, Wilson, Carvajal & Rouse, 2017
Family Stichopodidae Haeckel, 1896
Isostichopus badionotus (Selenka, 1867)
Voucher numbers. — UFPB.ECH.1987, 2137, 2144, 2146.
CIPY records. — AL and BA.
Notes. — From shallow reefs and Abrolhos Archipelago.

Discussion

The CIPY is home to a representative sampling of the invertebrate's marine fauna of Brazil, in particular of the shallow coastal environments of the North-eastern Region. Several represented species in the collection can be considered as rare since their populations are reduced in their natural habitats or they have apparently disappeared from some sampled localities (e. g. the cnidarians *Plexaurella grandiflora* and *Mussismilia harttii*, and the echinoderms *Echinometra lucunter* and *Ophioderma cinereum*, personal observations). Through time, the CIPY has been the main source for many research projects that have produced considerable results. These include communications in scientific meetings, dissertations, theses, and scientific articles. In turn, these works have enriched the collection since many species have been described and deposited in the CIPY. In total, 36 described species are housed in this collection (Table 1), of which 28 are endemic. Additionally, some new records have been cited for the Brazilian littoral based from material deposited at the CIPY (e. g. Young, 1988; Young & Christoffersen, 1984; De Assis *et al.*, 2008, 2015; Santos *et al.*, 2009; Gondim *et al.*, 2010, 2013a, 2015a, 2018a, b; Oliveira & Christoffersen, 2013; Brito *et al.*, 2013; Prata *et al.*, 2014b; Lucena *et al.*, 2017; Lucena & Christoffersen, 2019).

Many authors emphasize the social legacy that scientific collections represent for society and scientific advances in knowledge in distinct areas (Lane, 1996; Hone, 1997; Zaher & Young, 2003; Suarez & Tsutsui, 2004; Canhos *et al.*, 2006; Pyke & Ehrlich, 2010; Bi *et al.*, 2013; Oliveira & Costa, 2016; Powers *et al.*, 2019). According to Watanable (2019), as genetics, molecular biology, and chemical methods have advanced, researchers are turning to natural history collections to gain insights into everything from the history of infectious diseases to the evolution of specific traits. Nevertheless, many collections undergo difficulties that range from painful budgetary shortfalls (Suarez & Tsutsui, 2004), to lack of infrastructure and adequate material, and even lack of trained human resources for the adequate maintenance of these collections. This situation can be considered even more critical in collections housed in university departments, in which the curatorship activities are done by professors that accumulate functions of teaching, conducting research, and participating in extension projects (Marinoni *et al.*, 1988). Also, it is important to note that the function of a curator does not officially exist in Brazilian Federal Universities (Marinoni *et al.*, 2006; De Vivo *et al.*, 2014). This function is usually "inherited", and not exerted by affinity or identification with these activities by these professionals.

Other daily difficulties encountered in established collections are related to the conditions in which the material arrives. Often this material lacks complete data on their provenance (only field initials on station numbers may be present, for example). At other times, the material arrived in pitiful conditions of preservation and fixation. Many taxonomists become negligent with the material on

which new species are based, even forgetting to deposit the type material of the described species. Such difficulties, when combined, indicate how neglected biological collections may become. Consequently, more

Table 1. Type series housed in Invertebrate Collection Paulo Young (CIPY) of the Universidade Federal da Paraíba (Brazil).

Taxa	Voucher		Reference
Porifera/Demospongiae			
Clathria (Clathria) nicoleae Barros, Santos & Pinheiro, 2013	UFPB.POR.175	Holotype	Barros *et al.* (2013)
Damiria paraibana Santos & Pinheiro, 2013	UFPB.POR.179	Paratype	Santos & Pinheiro (2013)
Dercitus (Stoeba) pseudodiscorhabda Santos & Pinheiro, 2016	UFPB.POR.151	Holotype	Santos & Pinheiro, (2016)
Cnidaria/Anthozoa			
Plexaurella regia Castro, 1989	UFPB.CNID.279, 290	Paratypes	Castro (1989)
Annelida/Polychaeta			
Cossura yacy Sousa, Nogueira Júnior, Cutrim & Oliveira, 2019	UFPB.POLY.1736	Holotype	Sousa *et al.* (2019)
	UFPB.POLY.1735	Paratype	
Grubeulepis serrata Cutrim, Praseres, Conceição, Almeida, Nogueira Júnior & Oliveira, 2018	UFPB.POLY.1737	Holotype	Cutrim *et al.* (2018)
	UFPB.POLY.1738, 1739, 1740, 1741, 1742, 1743, 1744	Paratypes	
Nicolae ceciliae Santos, Nogueira, Fukuda & Christoffersen, 2010	UFPB.POLY.1392, 1393, 1394, 1395	Paratypes	Santos *et al.* (2010)
Nicomache brasiliensis De Assis, Alonso & Christoffersen, 2007	UFPB.POLY.111	Holotype	De Assis *et al.* (2007)
	UFPB.POLY.112	Paratype	
Nicomache lanai De Assis, Alonso & Christoffersen, 2007	UFPB.POLY.238	Holotype	De Assis *et al.* (2007)
	UFPB.POLY.255, 256	Paratypes	
Pista alonsae Santos, Nogueira, Fukuda & Christoffersen, 2010	UFPB.POLY.1396, 1397, 1398, 1390	Paratypes	Santos *et al.* (2010)
Sabellaria corallinea Santos, Riul, Brasil & Christoffersen, 2011	UFPB.POLY.634	Holotype	Santos *et al.* (2011)
	UFPB.POLY.635, 636, 637, 638, 639	Paratypes	
Sabellaria guamare Santos, Brasil & Christoffersen, 2014	CIPY.POLY.1689	Holotype	Santos *et al.* (2014)
	CIPY.POLY.1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706	Paratypes	

Sabellaria corallinea Santos, Riul, Brasil & Christoffersen, 2011	UFPB.POLY.634	Holotype	Santos *et al.* (2011)
	UFPB.POLY.635, 636, 637, 638, 639	Paratypes	
Sabellaria guamare Santos, Brasil & Christoffersen, 2014	CIPY.POLY.1689	Holotype	Santos *et al.* (2014)
	CIPY.POLY.1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706	Paratypes	
Scoloplos maranhensis Oliveira, Cutrim, Vieira, Ferreira, Almeida & Nogueira Júnior, 2019	UFPB.POLY.1730	Holotype	Oliveira *et al.* (2019)
	UFPB.POLY.1731, 1732, 1733, 1734	Paratypes	
Streblosoma patriciae Santos, Nogueira, Fukuda & Christoffersen, 2010	UFPB.POLY.1385, 1386, 1387	Paratypes	Santos *et al.* (2010)
Terebella leslieae Santos, Nogueira, Fukuda & Christoffersen, 2010	UFPB.POLY.1388, 1389, 1390, 1391	Paratypes	Santos *et al.* (2010)
Mollusca/Gastropoda			
Ancilla faustoi Matthews, Matthews & Dijck, 1979	UFPB.MOLL.001	Paratype	Matthews *et al.* (1979)
Caecum metamorphosicum Lima, Santos & Absalão, 2013	UFPB.MOLL.3546	Paratype	Lima *et al.* (2013)
Caecum tridadensis Lima, Santos & Absalão, 2013	UFPB.MOLL.3549	Paratype	Lima *et al.* (2013)
Crustacea/ Malacostraca			
Aegaeon boschii Christoffersen, 1988	UFPB.CRUST.4383	Holotype	Christoffersen (1988)
	UFPB.CRUST.4306, 4307, 4308, 4309, 4318, 4319, 4320, 4321, 4324, 4384	Paratypes	
Alpheus estuariensis Christoffersen, 1984	UFPB.CRUST.1068, 1069, 1070, 1071	Paratypes	Christoffersen (1984)
Alpheus cryptodentatus Christoffersen & Ramos, 1988	UFPB.CRUST.4392	Holotype	Christoffersen & Ramos (1988)
	UFPB.CRUST.4382, 4394	Paratypes	
Alpheus utriensis Ramos & von Prahl, 1989	UFPB.CRUST.4386	Paratype	Ramos & von Prahl (1989)
Alpheus wickstenae Christoffersen & Ramos, 1987	UFPB.CRUST.4329	Paratype	Christoffersen & Ramos (1987)

Crustacea/ Sessilia			
Ceratoconcha paucicostata Young, 1989	UFPB.CRUST. 2740, 2783, 2789	Paratypes	Young (1989)
Parapontocaris caribbaea (Boone, 1927)	UFPB.CRUST.4383	Holotype	Boone (1927)
	UFPB.CRUST.4384, 4385	Paratypes	
Crustacea/Pycnogonida			
Ammothella calva Lucena, Araújo & Christoffersen, 2019	UFPB.PYC.012	Holotype	Lucena *et al.* (2019)
	UFPB.PYC.056	Paratype	
Anoplodactylus ganchiformis Lucena & Christoffersen, 2018	UFPB.PYC.242	Holotype	Lucena & Christoffersen (2018)
	UFPB.PYC.217, 222, 243	Paratype	
Anoplodactylus mirim Lucena, de Araújo & Christoffersen, 2015	UFPB.PYC.085	Holotype	Lucena *et al.* (2015)
Anoplodactylus ricardoi Lucena & Christoffersen, 2018	UFPB.PYC.245	Holotype	Lucena & Christoffersen (2018)
	UFPB.PYC.134	Paratype	
Callipallene abrolhiensis Lucena & Christoffersen, 2016	UFPB.PYC.137	Holotype	Lucena & Christoffersen (2017)
Tanystylum parahybanum Lucena, Araújo & Christoffersen, 2019	UFPB.PYC.031	Holotype	Lucena *et al.* (2019)
	UFPB.PYC.014	Paratype	
Echinodermata/Ophiuroidea			
Amphioplus camamuensis Manso, 2004	UFPB.ECH.2158	Holotype	Manso (2004)
Echinodermata/Holothuroidea			
Havelockia nietae Prata, Manso & Christoffersen, 2020	UFPB.ECH.2120	Holotype	Prata *et al.* (2020)
Pentamera paraibanensis Prata & Christoffersen, 2016	UFPB.ECH.2229	Holotype	Prata & Christoffersen (2016)
	UFPB.ECH.2048, 2058, 2061, 2089, 2230	Paratypes	
Thyone brasiliana Prata, Manso & Christoffersen, 2020	UFPB.ECH.2121	Holotype	Prata *et al.* (2020)
	UFPB.ECH.2122	Paratype	
Chordata/Ascidiacea			
Eudistoma versicolor Rocha & Oliveira, 2014	LIPY.UFPB.TUN.308	Paratype	Oliveira *et al.* (2014)

time, effort and dedication is required by curators and associate curators.

Despite the difficulties hinted at above, many Brazilian invertebrate collections have been well organized in the latter years. There are circa 590 biological collections in Brazil (SiBBr 2013). Of these, only six zoological collections and two zoological museums are in North-eastern Brazil. The size (in number of samples) and broadness of these collections are variable. Discussions on the necessities and goals of biological collections have been widely debated (e. g. Marinoni, 1988; Zaher & Young, 2003; Suarez & Tsutsui, 2004; Kury *et al*., 2006), notably after the tragic fires that destroyed important collections such as Instituto Butantan, in São Paulo (in May 2010), and Museu Nacional, in Rio de Janeiro (in September 2018). Collections such as those of the CIPY have contributed to training of qualified human resources, to dissemination of information relative to preserved material, and to safeguarding Brazilian diversity, even considering in a limited range. Yet, considering the goals established by several publications on the conservation of Brazilian biodiversity (e. g. Maury, 2002; Kury *et al.*, 2006; Marques & Lamas, 2006; Systematics Agenda, 2000), there remains a long way to go. Conservation goals will only be reached with the creation and consolidation of specific national policies and directives to sustain biological collections.

Finally, it is important to stress that the CIPY represents the most embracing reference collection of shallow-water marine organisms available in the entire North-eastern Region of Brazil. This collection not only represents a valuable repository of national biodiversity, but also represents a patrimony for the university, that deserves recognition, appreciation, and must be made available to the scientific community and public in general (Oliveira & Costa, 2016).

With this work, we hope to provide information on the availability of specimens along the Brazilian littoral and to make the community aware of the necessities and the value of scientific collections.

Acknowledgments

This paper is dedicated to Dr Carmen Alonso Samiguel, who dedicated a large part of her career to the structure and maintenance of the CIPY. We would also like to thank all individuals that deposited their study material in this collection, thus contributing to its growth. All students and researchers that collaborated in the identification of specimens and in the preservation of the material are thanked heartily (particularly Dr João Guilherme B. De Marchi and Dr Felipe F. Campos, responsible for part of the identifications of the subcollections of the Porifera and Cnidaria, respectively). We also are grateful to anonymous reviewers, who kindly contributed with their constructive comments. Anne I. Gondim was supported by the CNPq through a postdoctoral scholarship (Process number: 150070/2018-7). Martin L. Christoffersen was supported by a CNPq productivity research grant (Process number: 301288/2018-6).

Peer-review: Externally peer-reviewed.

Author Contributions: Conception/Design of study: A.I.G.; Data Acquisition: A.I.G.; Data Analysis/Interpretation: A.I.G.; Drafting Manuscript: A.I.G., M.L.C., T.L.P.D.; Critical Revision of Manuscript: A.I.G., M.L.C., T.L.P.D.; Final Approval and Accountability: A.I.G., M.L.C., T.L.P.D.; Technical or Material Support: A.I.G., M.L.C., T.L.P.D.; Supervision: A.I.G.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Financial Disclosure: There are no funders to report for this submission.

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Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

İSTANBUL UNIVERSITY PRESS

RESEARCH ARTICLE/ARAŞTIRMA MAKALESİ

Harran Üniversitesi Herbaryum (HARRAN)'undaki Fabaceae Familyasının Taksonları

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Başvuru: 15.06.2020
Revizyon talebi: 25.06.2020
Son revizyon teslimi: 11.07.2020
Kabul: 18.07.2020

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Atıf: Latifi, A. ve Akan, H. (2020). Harran üniversitesi herbaryum (HARRAN)'undaki fabaceae familyasının taksonları. *Turkish Journal of Bioscience and Collections, 4*(2), 64–104.
https://doi.org/10.26650/tjbc.20200088

Öz

Bu çalışma; Harran Üniversitesi Herbaryum (HARRAN)'undaki Fabaceae familyası koleksiyonunu yeniden değerlendirmek ve takson sayısını belirlemek amacıyla yapılmıştır. HARRAN Herbaryumu'nda bulunan Fabaceae familyasına ait 975 bitki örneğinin incelenmesi sonucu 25 cinse ait 200 takson tespit edilmiştir. Bu taksonların 33'ü Türkiye için endemiktir. HARRAN Herbaryumunda bulunan Fabaceae familyasının takson açısından zengin cinsleri *Astragalus* L. (48), *Medicago* L. (37), *Trifolium* L. (25), *Trigonella* L. (22) ve *Vicia* L. (20)'dır. Herbaryumda Fabaceae familyasına ait taksonların fitocoğrafik bölgelere göre dağılımı İran-Turan %47, Akdeniz %32,5, Avrupa-Sibirya %2,5 ve fitocoğrafik bölgesi bilinmeyenler ise %18'dir. Bu çalışma sonucunda, *Alhagi*, *Astragalus, Hedysarum*, *Onobrychis, Scorpiurus, Trifolium* ve *Trigonella* cinslerine ait bazı taksonların sinonim olduğu tespit edilmiş olup, geçerli isimleri de bu çalışmada verilmiştir.

Anahtar Kelimeler: Fabaceae, HARRAN, Herbaryum, Şanlıurfa

The taxa of Fabaceae family in Harran University Herbarium (HARRAN)

Abstract

The aim of this study, was carried out to re-evaluate the Fabaceae family collection in Harran University Herbarium (HARRAN) and to determine the number of taxa. As a result of the examination of 975 specimens belonging to Fabaceae family in HARRAN Herbarium, 200 taxa belonging to 25 genera were determined. 33 of these taxa are endemic to Turkey. Fabaceae family found in HARRAN Herbarium, in terms of taxon richness are *Astragalus* L. (48), *Medicago* L. (37), *Trifolium* L. (25), *Trigonella* L. (22) and *Vicia* L. (20). The distribution of taxa belonging to Fabaceae family according to phytogeographic regions in herbarium is Irano-Turanian 47%, Mediterranean 32.5%, Euro-Siberia 2.5% and those with unknown phytogeographic region are 18%. As a result of this study, it is determined that some of the taxa belong to genus *Alhagi*, *Astragalus*, *Hedysarum*, *Onobrychis*, *Scorpiurus* and *Trigonella* fall into synonym and valid names are given in this study.

Keywords: Fabaceae, HARRAN, Herbarium, Şanlıurfa

Giriş

Türkiye; dünya üzerindeki coğrafik konumu, Asya, Avrupa ve Afrika kıtalarının birleştiği yerde olması, bulundurduğu farklı anakaya tipleri ile jeomorfolojik yapısı, üç tarafının denizlerle kaplı olması ile farklı iklim tiplerinin etkisi altında kalması neticesinde oldukça zengin bir florası bulunmaktadır (Ekim, 1990).

Türkiye Florası'nı araştırmaya yönelik yapılan çalışmalar Fransız Botanikçi olan Pitton de Tournefort'un 18. yüzyıl başlarında Anadolu'nun birçok bölgesine yapmış olduğu gezilerle başlamış bulunmaktadır. Türkiye'ye ilk gelen botanikçi Tournefort, topladığı bitkileri bir flora listesi halinde yayımlamıştır (Yerasimos, 2005). Bunu 18. yüzyılın sonunda İzmir ve Uludağ'da bitki toplayan İngiliz Sibthorp izlemiştir. 1830'larda Anadolu'yu gezen Aucher Eloy çoğunlukla hudut bölgelerinden, 1836 yıllarında Avustralya'lı Kotschy, Toroslardan, "Flora Orientalis"in yazarı Cenevre'li botanikçi Edmont Boissier, İzmir ve civarından, 1845-1851 yılları arasında Heldreich özellikle İzmir civarından bitki toplamıştır (Regel, 1963; Baytop 2003). İkinci safhada flora listelerinden daha ileri çalışmalar yapılmış, Handel Mazetti, Krause, Schwarz, Czeczott, H. Birand, Mattfeld, Web, Wenzel ve Turill, Türkiye'nin değişik bölgelerinin vejetasyonunu incelemişlerdir. Louis, Regel, Walter, Davis ve İnandık'ın eserleri, Türkiye'nin florasıyla ilgili genel nitelikteki araştırmalardır (Dönmez, 2014). Türkiye Florası'na esas katkı, İsviçreli botanikçi Edmond Boissier tarafından (Boissier, 1867–1888) yayımlanan 5 cilt ve bir tamamlayıcı cilde sahip olan "Flora Orientalis" adlı eserdir (Ekim, 1997). Bu eserde kendi topladığı bitkilerle birlikte kendinden önceki araştırıcıların topladıkları bitkilere de yer vermiştir. Flora Orientalis'ten yüz yıl sonra yayını tamamlanan, editörlüğünü Peter Hadland Davis (1965–1985)'in yaptığı 9 cilt içeren "Flora of Turkey and The East Aegean Islands" isimli eserdir. 1988'de 10. cilt (Davis et al., 1988), 2000 yılında da 11. cilt ek olarak Türk botanikçileri tarafından yayınlanmıştır (Güner ve ark., 2000). Ayrıca, Türkiye Bitkileri Listesi (Damarlı Bitkiler) kitabı çıkarılmıştır (Güner ve Ekim 2012). Daha sonra Resimli Türkiye Florası'nın yazım çalışmalarına başlanmış ve buna temel olmak üzere Resimli Türkiye Florası 1. cildi (Güner 2014) çıkarılmıştır. Türk botanikçilerinin özverili çalışmalarının ürünü olan Resimli Türkiye Florası, bu özellikleriyle botanik tarihimiz açısından farklı öneme sahiptir. Barındırdığı canlı çeşitliliği ve zenginliğiyle bir ülkeden çok kıta olarak da kabul edilebilecek ülkemizde, Cumhuriyet'in 100. yılı onuruna hazırlanan Resimli Türkiye Florası, 30 cilt olarak planlanmıştır. En son Resimli Türkiye Florası 2.cildi yayımlanmıştır (Güner vd., 2018).

Türkiye'de 167 familya, 1320 cins ve bu cinslere ait toplam 11707 takson bulunmaktadır. Taksonlardan 3649"ü Türkiye için endemiktir (Güner vd., 2012).

Fabaceae (Leguminosae) familyası dünyada yaklaşık 730 cins ve 20.000 tür ile yayılış gösteren üçüncü en geniş angiosperm familyasıdır (Wojciechowski et al., 2004; Mabberley, 2017)

Fabaceae, APG IV sistemine göre Fabales takımına yerleştirilmektedir. Familya yeni sisteme göre 6 alt aile içermektedir (APG IV, 2016)

- **Cercidoideae** : 12 cins ve ~ 335 tür. Ağırlıklı olarak tropikal. *Bauhinia*, *Cercis*.
- **Detarioideae** : 84 cins ve ~ 760 tür. Genellikle Tropikal. *Amherstia*, *Detarium*, *Tamarindus* .
- **Duparquetioideae** : 1 cins ve 1 tür. Batı ve Orta Afrika. *Duparquetia* .
- **Dialioideae** : 17 cins ve ~ 85 tür. Tropik boyunca yaygın. *Dialium* .
- **Caesalpinioideae** :148 cins ve ~4400 türleri. Pantropical *Caesalpinia*, *Senna*, *Mimosa*, *Akasya*

Eski alt ailesini Mimosoideae (çoğunlukla tropikal, sıcak ılıman Asya ve Amerika, 80 cins ve ~ 3200 türü) içerir.

- **Faboideae (Papilionoideae)**: 503 cins ve ~ ve 14.000 tür. Kozmopolit. *Astragalus*, *Lupinus*, *Pisum*)

Fabaceae familyası Güner ve ark. (2012) tarafından yayımlanan Türkiye Bitkileri Listesi isimli kitaba göre ülkemizdeki Fabaceae familyası 72 cins, güncel takson sayısı 1228, endemik takson sayısı ise 383'tür.

Fabaceae familyasına ait bilimsel çalışmalar ve herbaryum revizyonları ile ilgili araştırmalara örnek olarak; Aytaç (1997), Maassoumi ve ark. (1998), Ekici ve Ekim (2004), Hoşgören (2004), Ekici ve ark (2005), Çetinkaya (2007), Yılmaz (2007), Mırdeslioğlu (2008), Akan ve ark (2008), Ekici ve ark (2008), Pınar Güzel (2010), Eren (2010), Akkoyunlu (2011), Karataş (2013), Taeb (2013), Çetiner (2013), Toksoy (2013), Akan ve Aytaç (2014), Mahamat (2014), Yıldız (2014), Kocabaş (2014), Kaplan (2014) ve Avcıl (2019) verilebilir.

Familya içerisindeki türler kuzey kutbunun ve alpin vejetasyonunun küçük otsularından tropikal ormanların büyük ağaçlarına kadar değişmektedir. Familyanın en karakteristik özelliği kendine has olan legümen veya lomentum tipi meyvesidir Ödikotlar içerisinde ekonomik olarak en önemli familyalardan biridir. Dünya tarımı için yiyecek sağlamada ikinci, tahıl üretiminde birinci

sıradadır. Legümen tohumları protein içeriği bakımından yüksek kalitededir ve yüksek besin değerine sahiptir. Ekonomik değeri yüksek olan türler arasında bezelye, bakla, mercimek ve nohut verilebilir. *Lupinus* L., *Medicago* L. ve *Trifolium* L. gibi cinslere ait birçok türler hayvan yemi ve gübre olarak da kullanılmaktadır. Bunların yanında baklagillerden sakız, zamk, kereste ve tıbbi amaçlı olarak da faydalanılmaktadır (Yılmaz, 2007).

Önemli özelliklerini kaybetmeksizin kurutulup karton üzerine tespit edilerek muhafaza edilen bitki ya da bitki kısımlarından oluşan koleksiyonların bulunduğu yere herbaryum denir (Uma & Düzenli, 2012). Türkiyenin bitki örneklerinin saklandığı yöresel herbaryumlarda bulunan bitki varlığı ve bitki örneklerinin bilinmesi, familya ve cins revizyonu yapan araştırıcılar için önem arzetmektedir. Fen-Edebiyat Fakültesi Herbaryumu "HUB" ve Eczacılık Fakültesi Herbaryumu "ISTE" gibi herbaryumlar verilebilir (Baytop, 2003). Yurtdışında da yüzlerce bitki örneklerinin saklandığı herbaryumlar mevcuttur. Edinburgh Kraliyet Bahçesi Herbaryumu (E), Paris Üniversitesi Herbaryumu (P), Berlin Herbaryumu (B), Leningrad Herbaryumu (LE), Kew Herbaryumu (K) ve bunun gibi diğer herbaryumlar örnek olarak verilebilir.

2001 yılında kurulan ve 2017 yılından beri Uluslararası Kod'a sahip olan Harran Üniversitesi Herbaryumu, HARRAN koduyla bilinmektedir (New York Botanical Garden Herbarium, 1895 http://sweetgum.nybg.org erişim tarihi 21.03.2020).

2001 yılında kurulan Harran Üniversitesi (HARRAN) herbaryum çalışmaları açısından yeterli kaynak yoktu. İlerleyen yıllarda botanik alanında yapılan çalışmaların artmasıyla herbaryum koleksiyonları artmaya başlamıştır. Herbaryumumuz Fen bilmleri alanında pek çok araştırıcıya, özellikle Botanik Anabilim dalında yüksek lisans ve doktora yapan genç araştırıcılara hizmet vermektedir.

HARRAN herbaryumunda farklı familyalara ait 7000'nin üzerinde bitki örneği mevcuttur. Bu örneklerden özellikle Fabaceae familyasına ait *Trigonella* ve *Astragalus* cinslerine ait hemen hemen bütün taksonları bulunmaktadır. Dr. Hasan Akan'ın TÜBİTAK tarafından desteklenen bazı projeleri (Aytaç &Akan, 2000 TGAB-1575; Ekici vd., 2005, TBAG-1959; 2009 TÜBİTAK 106T284; Akan vd., 2006 TBAG-2099, Akan, 2007 HÜBAK 798) nedeniyle Fabaceae koleksiyonu daha da arttırmıştır. Şanlıurfa ilinin Geofit Florası da tez olarak ikinci yazar tarafından yönetildiği için HARRAN herbaryumu Geofit koleksiyonu açısından da zengin konumdadır (Eker vd., 2008). Güneydoğu Anadolu Bölgesinde taksonomik araştırmalar yapan birçok araştırıcının herbaryumda kendilerine ait özel koleksiyonları da bulunmakta ve örnekler teşhis edildikçe herbaryuma kazandırılmaktadır.

Türkiye Florası'nın P.H. Davis editörlüğünde yayınlanmasından sonra Türkiye'deki sistematik çalışan botanikçiler Türkiye Florası'nda problemli olan familya ve cinsleri revize etmeye başlamışlardır. Revizyon çalışmaları için herbaryum koleksiyonlarının bilinmesi çok önem arz etmektedir. Çalışmamızın temel amacı Harran Üniversitesi Herbaryum (HARRAN)'unda bulunan ve ülkemizde zengin taksonlarla temsil edilen Fabaceae (Leguminosae) familyasına ait bitki örneklerinin yeniden değerlendirilerek Uluslararası Nomenklatürel Kod"a (kurallarına) uygun ve doğru olarak adlandırılması ve bir envanterinin (liste) çıkarılmasıdır. Nitekim, ülkemizin bir çok herbaryumlarında farklı familyalara ait bitki koleksiyonlarının lisansütü tez çalışmalarıyla yeniden değerlendirildiğini ve bu çalışmaların yayımlandığını görmekteyiz (Yıldız, 1994; Kepek 2003; Tuğrul, 2004; Ekmekçi, 2006; Yalçınkaya, 2006; Çetiner, 2006; Yılmaz, 2007; Çetinkaya, 2007; Balcı, 2009; Geven vd., 2008; 2009; Ketenoğlu & Körüklü, 2009; Demircioğlu 2009; Ersoy 2009; Özdeniz & Kurt, 2012; Uma & Düzenli, 2012; Güzel 2010; Akkoyunlu, 2011, Korkmaztürk, 2011; Geven vd., 2014; Mahamat, 2014; Aybeke, 2008, 2016; Kılıçkaya, 2017; İpek, 2018; Üzgör, 2019; Onaylı, 2019; Bal, 2019; Özel, 2019; Bebekli, 2019; Keskin, 2019).

HARRAN herbaryumunda bulunan Fabaceae familyasına ait taksonların neler olduğu ve sayısı tam olarak bilinmemekteydi. Bu çalışmanın konusunu oluşturan HARRAN herbaryumundaki Fabaceae familyasına ait örneklerin değerlendirme çalışmalarında, botanik adlandırma kurallarına göre geçerli kabul edilen taksonlara doğru isim verilmesi, bitki örneklerinin yeniden değerlendirilmesi, taksonların yeniden teşhis edilmesi, taksonlarlardaki hatalı teşhislerin giderilmesi, etiket bilgilerinin tamamlanması, bitkilerin herbaryum materyali haline getirilmesi, bir envanterinin çıkarılması ve örneklerin fotoğraflarla daha anlaşılır hale getirilmesini kapsamaktadır.

Araştırmamızın bundan sonra yapılacak olan florastik, taksonomik ve korolojik çalışmalara fayda sağlayacağı kanaatindeyiz. Zira, bitki sistematiği açısından herbaryumların gelişmesi ve böyle düzenli halde araştırmacıların hizmetine sunulması bilim için önemli bir katkıdır.

Materyal ve Metod

Çalışma materyalini Harran Üniversitesi Herbaryumu (HARRAN)'ndaki Fabaceae (Leguminosae) familyasına

ait 975 bitki örneği oluşturmaktadır. Bu örneklerin değerlendirilmesi sonucu 25 cinse ait 200 takson tespit edilmiştir. Bu örnekler Flora of Turkey (Davis 1965-1985, Davis et al., 1988), Güner vd., (2000), Podlech & Zarre (2013) adlı eserden yararlanılarak teşhis edilmiştir. Bazı taksonların teşhisi için İran (Rechinger, 1999, 2008, 2010), Irak (Townsend, 1974), Suriye (Post, 1896), Filistin (Zohary, 1987) gibi ülke floralarından da yararlanılmıştır. Ayrıca bazı cinslere ait örneklerin teşhisinde bu konuda uzman araştırmacıların yayın ve tezlerinden (Ertekin, 1991; Akan & Aytaç, 2014, Karaman Erkul vd., 2016; Jalilian et al., 2016; Ateş vd., 2017) yararlanılmıştır.

Taksonların verilişinde alfabetik sıralamaya uyulmuştur. Bitki listesinin yazımında tekrardan kaçınmak için, aynı karelerden toplanmış örnekler bir araya getirilmiştir. Bitkinin toplandığı mevkii veya yer adı, yükseklik, tarih, habitat, toplayıcı numarası ve endemizm durumu verilmiştir.

Fabaceae familyasına ait HARRAN'da kayıtlı endemik taksonların tehlike kategorileri Türkiye Bitkileri Kırmızı Kitabı (Ekim vd., 2000)'na göre verilmiştir. Endemik bitkilerin IUCN tehlike kategorileri ve kriterleri ''The IUCN Red List Categories and Criteria (versiyon 3.1) ve göre bu konuda yapılan değişikliklerde dikkate alınarak düzenlenmiştir (IUCN, 2017). Endemik bitkiler için kullanılan tehlike kategorilerinin kısaltmaları ve açıklamaları şöyledir: NE: Değerlendirilemeyen, CR: Çok tehlikede, EN: Tehlikede, VU: Zarar görebilir, NT: Tehdide yakın ve LC: Az endişe verici.

Çalışmamızın sonunda familyaya ait tüm bitki örneklerinin karton ve etiketleri yenilenmiş ve herbaryum örnekleri yeniden kontrol edilmiştir. Materyal olarak kullanılmış olan tüm bitki örneklerinin çalışma esnasında zarar görmemesine dikkat edilmiştir.

Harran Üniversitesi Biyoloji Bölümü Botanik Anabilim dalına ait olan HARRAN Herbaryumun genel görüntüleri Şekil 1-4'de verilmiştir. Familyaya ait bazı taksonların fotoğraflarına Ekler bölümünde yer verilmiştir (Ekler, Şekil 1-36).

Bu çalışmada, bitki türlerinin bilimsel otor isimleri www.theplantlist.org isimli veritabanına göre verilmiştir.

Türlerin ülkemizdeki yayılışının daha kolay izlenebilmesi için Davis (1965)'in önerdiği grid sistemi kullanılmıştır. Bu sistemde Türkiye enlem ve boylamların geçtiği dereceler esas alınarak toplam 29 kareye ayrılmıştır.

Bitki lokaliteleri verilirken, aynı yerden toplanmışsa, tekrarlardan kaçınmak İbid. İfadesi kullanılmıştır.

Her bir taksonun Türkçe ismi Türkiye Bitkileri Listesi (Damarlı Bitkiler) (Güner vd., (2012), isimli kitaba göre verilmiştir.

Herbaryumdaki tüm taksonlar tarafımızdan görüldüğü için tekrardan kaçınmak adına "!" işareti her bir takson için yazılmasına gerek görülmemiştir.

Şanlıurfa yöresinde yapılan floristik çalışmaların (Akan & Ayaz 2016; Aydoğdu & Akan 2005; Mirdeslioğlu 2008; Balos & Akan 2008; Korkut vd. 2008; Akan vd., 2005) bitkileri herbaryumumuzda mevcuttur. Herbaryumda örnekleri olan bitki toplayıcılarının isimleri şöyledir:

Adıgüzel	: Nezaket Adıgüzel
Akan	: Hasan Akan
Ayaz	: Hatice Ayaz
Aytaç	: Zeki Aytaç
Civelek	: Şemsettin Civelek
Çetin	: Esat Çetin
Duman	: Hayri Duman
Eker	: İsmail Eker
Ekici	: Murat Ekici
Aydoğdu	: Mahmut Aydoğdu
MMB	: Mehmet Maruf Balos
MNM	: Mehmet Nezif Mirdeslioğlu
Korkut	: Mehmet Mustafa Korkut

Bulgular

FABACEAE Lindl. (1836) / /LEGUMINOSAE Juss. (1789) nom. cons.) BAKLAGİLLER

ALHAGI Adans. (1755) / Aguldikeni
Alhagi maurorum Medik. subsp. ***maurorum*** (1787) /Agul dikeni
C7 Şanlıurfa: Birecik, Yukarı Almaşar Köyü kuzeyi, 720 m, step, 04.07.2004, Korkut 660; Birecik, Zeytinbahçe, 450 m, tarla kenarı, 20.06.2005, MMB 1546; Bozova yolu, Kalecik Dağı güneydoğusu, 750 m, beyaz topraklı alanlar, 20.08.2003, Aydoğdu 1516. İran-Turan elementi.

ANAGYRIS L. (1753) /Zivircik
Anagyris foetida L. (1753) / Zivircik
C7 Şanlıurfa: Karaköprü; Güzel Köyü (Dağ eteği), 655 m, taşlık yamaçlar, 25.04.2008, MNM 1350. Akdeniz elementi.

ANTHYLLIS / Çobangülü L. SP. PL. 2: 719 (1753)
Anthyllis circinnata (L.) D.D. Sokoloff
C7 Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1166; Şanlıurfa-Birecik 70 km, 630 m, tarla kenarı, 04.05.2008, MNM 1388; Birecik, Mezra-Adacık 5 km, 430 m, step, 06.06.2004, MMB 891, MMB 1368; Şanlıurfa-

Bozova yolu, Çimento fabrikası arkası, Nergisli köyü, 745 m, step, 29.04.2007, MNM 1238; Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3050; Şanlıurfa-Viranşehir 5 km, 500 m, boş alanlar, 16.04.2006, MNM 1004. Akdeniz elementi.

ARGYROLOBIUM Eckl. & Zeyh. (1836) /Collik

Argyrolobium crotalarioides Jaub. & Spach (1843) / Collik (Ekler, Şekil 1)

C6 Şanlıurfa: Eski Halfeti; 395 m, dere içi, 25.04.2008, MNM 1352; Şanlıurfa-Halfeti 3 km, 08.06.2008, MNM 1379, MNM 1448; Birecik, Mezra-Akarçay 1 km, 24.04.2004, 450 m, step, MMB 657, MMB 866, MB 898, MMB 1345; Birecik, Arat Dağı kuzeybatısı, 800 m, taşlık alan, 09.05.2004, Korkut 540, 635; Bozova-Şanlıurfa yolu: Çimento fabrikası yanı, 694 m, step, 20.05.2007, MNM 1285, MNM 1427; Hilvan-Şanlıurfa 25 km, 720 m, yol kenarı, 26.05.2007, MNM 1317. İran-Turan elementi.

Şekil 1. Harran Üniversitesi herbaryumu (HARRAN)'ının giriş kapısı

Şekil 2. HARRAN herharyumunda kurutulmuş bitki örneklerinden genel bir görünüm

ASTRAGALUS L. (1753) /Geven

Astragalus ancistrocarpus Boiss. & Hausskn. (1872) / Eğri geven

Şekil 3. HARRAN herbaryumu dolaplarından genel bir görünüm

Şekil 4. HARRAN Herbaryumunun içinden genel görünüm

C7 Şanlıurfa: Birecik, Mezra-Adacık arası 5 km, Savi deresi mevkii, 500 m, step, 06.06.2004, MMB 922, MMB 1063; Birecik, Zeytinbahçe-Adacık 3 km, 460 m, step, 28.07.2004, MMB 1126; Birecik, Mardin-Şanlıurfa yolu, Osmanbey kampüsü, kuzey yamaçlar, 500 m, step, 27.03.2007, MNM 1149; İbid., 06.05.2008, MNM 1389. İran-Turan elementi.

A. aduncus Willd. (1802) / Çengel geven (Ekler, Şekil 2)

C6 Şanlıurfa: Birecik: Bentbahçesi, 570 m, yol kenarı, 06.05.2007, MNM 1253, MNM 1372; Birecik, Ziyaret tepesi-Zeytinbahçe yolu, 09.05.2004, step, 500 m, MMB 870, MMB 1343; Birecik, Arat Köyü güneybatısı, 740 m, step, 27.04.2003, Korkut 131, 479, 591; Halfeti-Şanlıurfa karayolu 15 km, 500 m, taşlık alan, 25.04.2008, MNM 1349; Şanlıurfa-Viranşehir 35 km, 540 m, step, 13.05.2007, MNM 1280; Bozova-Şanlıurfa yolu, Kaşmer Dağı, 774 m, step, 20.05.2007, MNM 1283, MNM 1413, MNM 1049; Bozova-Hilvan 15 km, 700 m, step, 10.05.2008, MNM 1415; Şanlıurfa-Bozova yolu, Kırkpınar köyü doğusu, 500 m, taşlık alanlar, 25.05.2003, Aydoğdu 1463; Kaşmer Dağı, Aşıkkköy, 600 m, step, 14.05.2002, Akan 1811, Akan 3945; **C7** Şanlıurfa-Viranşehir 40 km, 560 m, yol kenarı, 22.04.2008, MNM 1334, MNM 1393; Birecik, Divriği Köyü,

760 m, yolu kenarı, 27.04.2003, Korkut 100; Bozova yolu, Kalecik Dağı; Korukezen köyü civarı, 600 m, beyaz topraklı alanlar, 19.05.2003, Aydoğdu 1369; Uyuzpınar köyü, 600 m, step, 31.05.2002, Akan 2072. İran-Turan elementi.

A. aleppicus Boiss. (1843) / Halep geveni (Ekler, Şekil 3)
C7 Şanlıurfa: Birecik, Zeytinbahçe doğusu, 400 m, taşlık alan 27.03.2004, MMB 244; Birecik, Arat Dağı, 830 m, bağ kenarı, 04.05.2008, MNM 1377; Hilvan-Urfa yolu 30 km, 720 m, tarla içi, 26.05.2007, MNM 1316, MNM 1409; Bozova-Şanlıurfa yolu, Kalecik Dağı; Korukezen köyü kuzeybatısı, 750 m, taşlık alanlar, 24.04.2003, Aydoğdu 1001, 1201, 1228, 1443; İbid., Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1059. İran Turan- elementi.

A. alopecurus Pall. (1800) /Büyük geven (Ekler, Şekil 4)
A8 Erzurum: Erzurum-Tortum 17 km, 1800 m, yol kenarı, 28.6.1997, Akan 1288/b & Ekici, Akan 1185; Horasan yolu, 1750 m, yol kenarı, 06.07.1997, Akan 1367; Bayburt: Bayburt-Aşkale 16 km, 1800 m, 29.6.1997, yamaçlar, Akan 1302 & Ekici, Akan 1371; **A9** Erzurum: Horasan-Sarıkamış, Bademözü mevkii, 1770 m, 6.8.1997, Akan 1366 & Ekici; **B6** Sivas: İmranlı, 1550 m, 2.7.1997, Akan 1336 & Ekici; **B9** Ağrı: Eleşkirt, Sarıcan köyü, 2200 m, dere kenarı, 5.8.1997, Akan 1361 & Ekici, Van: Çatak, Narlıca köyü-Bahçesaray yolu, 2100 m, yol kenarı, 18.07.1991, Akan 1350. İran-Turan elementi.

A. angustifolius Lam. subsp. ***angustifolius*** (1783) / Keçi geveni
C7 Şanlıurfa: Kalecik D.; Kırkpınar, 800 m, 06.04.2003, Aydoğdu 1207. İran-Turan elementi.

A. angustiflorus C. Koch. subsp. ***angustiflorus*** /İnce geven
C7 Şanlıurfa: Bozova yolu, Kırkpınar köyü, 800 m, step, 06.04.2003, Aydoğdu 1207; Gölpınar köyü civarı, 730 m, step, 14.iv.2010, Ayaz 1293; Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 2976. İran Turan elementi.

A. asterias Steven. (1838) /Yıldız geveni
C7 Şanlıurfa: Birecik, Bentbahçesi-Bozdere 2 km, 490 m, step, 27.03.2005, MMB 1222, MMB 379, MMB 532, MMB 871; Birecik, Arat köyü kuzey batısı, 780 m, step, 04.07.2004, Korkut 633; Şanlıurfa-Viranşehir karayolu 5 km, 550 m, boş alanlar, 16.04.2006, MNM 1005, MNM 1272, MNM 1335, MNM 1021; Bozova; Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1134, MNM 1228; Şanlıurfa-Suruç 20 km, 665 m, step, 08.04.2007, MNM 1173; Şanlıurfa-Hilvan karayolu 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1180. İran Turan- elementi.

A. aytatchii Akan & Civelek (2001) /Şah geveni
B6 Sivas: Taşlıdere, Domuzluk mevkii, Hocabey köyü, Kırmızı tepe, 1500–1600 m, gipsli topraklar, 14.06.1998, Akan 1428 & Civelek. ***Endemik***. İran-Turan elementi.

A. bahcesarayensis Akan, Fırat & Ekici (2008) /Saray geveni
B9 Van: Bahçesaray, Kirapit geçidi, 3200–3400 m, taşlık yamaçlar, 05.08.2004, Fırat 4221; Bahçesaray, Yukarı Narlıca-Karabel geçidi, 2500 m, taşlık yamaçlar, 7.07. 2001, Akan 2256 & Ekici. ***Endemik***. İran-Turan elementi.

A. barba-jovis DC. (1802) / Öküz geveni
C7 Şanlıurfa: Siverek: Karacadağ-Karabahçe 5 km, 1535 m, step, 23.06.2007, MNM 1329; İbid., 1420 m, step, 18.05.2008, MNM 1439. İran-Turan elementi.

A. caprinus L. subsp. ***caprinus*** (1763) / Teke geveni
C6 Şanlıurfa: Birecik; Çiftlik Köyü, 461 m, step yamaçlar, 04.05.2008, MNM 1374, MNM 1319; **C7** Şanlıurfa: Bozova yolu, Korukezen köyü, 700 m, taşlık yamaçlar, 17.03.2002, Aydoğdu 1018 & Akan; Aşıkköy, 880 m, step, 14.05.2001, Akan 1816, Akan 2092; Şanlıurfa-Bozova yolu: Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1088, M 1215, Kaşmer Dağı, 774 m, step, 20.05.2007, MNM 1287; Şanlıurfa-Hilvan 10 km, Yukarı İskara köyü, 690 m, yol kenarı, 26.05.2007, MNM 1315, MNM 1358. İran Turan- Elementi.

A. caspicus M. Bieb. subsp. ***caspicus*** (1808) / Hazargeveni
C7 Şanlıurfa: Siverek, Karacadağ-Karabahçe 5 km, 1535 m, step, 23.06.2007, MNM 1326. İran-Turan elementi.

A. cephalotes Banks & Sol. var. ***cephalotes*** (1794) / Başlı geven
C7 Şanlıurfa: Bozova yolu; Kızlar köyü civarı, 720 m, tarla kenarı, 13.05.2006, MNM 1097; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1120.

A. cretaceus Boiss. & Kotschy (1856) / Gök geven (Ekler, Şekil 5)
C6 Şanlıurfa: Birecik, Zeytinbahçe-Abdallı arası, 370 m, dere kenarı, 04.05.2008, MNM 1375; İbid., 510 m, step, 01.05.2005, MMB 1381; Birecik, Ziyaret tepesi, 560 m, yamaçlar, 09.05.2004, MMB 837; Birecik, Zeytinbahçe

doğusu, 400 m, step, 27.03.2004, MMB 235; Adacık köyü çevresi, 430 m, dere kenarı, 06.06.2004, MMB 967. İran Turan-elementi.

A. crinitus Boiss. (1843) / Köse geven (Ekler, Şekil 6)
B9 Erzurum: Erzurum-Ağrı yolu 125 km, Sarıcan köyü girişi, 2050 m, yol kenarı, 29.07.1998, Akan 1488; Erzincan, Avcılar köyü, Gökbayır mevkii, 1200 m, yol kenarı, 28.06.1997, Akan 1295, 1293; Ağrı: Ağrı-Horasan yolu 37 km, 2000 m, yol kenarı, 30.06.1997, Akan 1312, 1362. ***Endemik***. İran-Turan elementi.

A. decurrens Boiss. (1846) / Kulaklı geven (Ekler, Şekil 7)
B7 Elazığ: Elazığ-Hazar gölü 5 km, 1200 m, yol kenarı, 03.07.1997, Akan 1339; Malatya: Balaban-Levent 9 km, 1000 m, taşlık, 13.6.1998, Akan 1427 & Ekici. İran-Turan elementi.

A. diphtherites Fenzl. var. ***diphtherites*** (1843) / Yamaç geveni
C6 Şanlıurfa: Birecik-Halfeti 3 km, step, 08.06.2008, MNM 1450, MNM 1320; Şanlıurfa-Bozova 25 km, 700 m, step, 09.06.2007, MNM 1321; Ceylanpınar, Gümüşsu; Sarnıçtepe mevkii, 430 m, step, 01.07.2007, MNM 1332. İran-Turan elementi.

A. dipodurus Bunge (1868) / Gürbüz geven
C6 Şanlıurfa: Birecik; Arat Dağı, 830 m, bağ kenarı, 04.05.2008, MNM 1384; Bozova yolu: Kızlar köyü civarı, 720 m, tarla kenarı, 13.05.2006, MNM 1098&Akan; Şanlıurfa-Hilvan 32 km, (Eski Urfa yolu), 720 m, yol kenarı, 10.05.2008, MNM 1410. İran-Turan elementi.

A. dipsaceus Bunge. (1868) / Kıllı geven (Ekler, Şekil 8)
A4 Kırıkkale: Akpınar-Keskin 10 km, 1100 m, step, 4.8.1997, Akan 1353 & Ekici; **A5** Çorum: Çorum-Osmancık 17 km, Maksutlu köprüsü, 700 m, yol kenarı, 16.06.1998, Akan 1451; **A6/B6** Sivas: Kızıliniş, 1300 m, yol kenarı 14.6.1999, Akan 1610; **A8** Bayburt: Bayburt-İspir 60 km, 1320 m, yol kenarı, 29.6.1997, Akan 1308 & Ekici; **B7** Erzincan: İliç, Yakuplu köyü, 1200 m, yol kenarı, 27.6.1997, Akan 1277 & Ekici; **B8** Erzurum: Kemer-Hasanoba girişi, 1050 m, bahçe kenarı, 27.06.1997, Akan 1283. **Endemik.** İran-Turan elementi.

A. echinops Boiss. (1843) / Topuzgeveni
B7 Elazığ: Elazığ-Tunceli 60 km, 1020 m, yol kenarı, 3.7.1997, Akan 1338 & Ekici; Diyarbakır: Eğil-Diyarbakır 3 km, 900 m, tarla kenarı, 7.6.1998, Akan 1411; **C6** Gaziantep: Bahçe-Gaziantep 68 km, 1000 m, yol kenarı, 1.8.1998, Akan 1536; **C9** Şırnak: Şırnak-Hakkari 13 km, 1400 m, yol kenarı, 05.06.2001, Akan 2175, 2174, 2176. İran-Turan elementi.

A. ekicii H. Duman & Akan (2003) /Hangeveni
B6 Malatya/C6 Adıyaman: Sürgü-Gölbaşı 5 km, 1400–1450 m, taşlık yamaçlar, 29.6.2001, Akan 3646. **Endemik**. İran-Turan elementi.

A. ekimii Zarre & H. Duman (1998) / Çelebi geven
C7 Şanlıurfa: Siverek; Karacadağ-Karabahçe 5 km, kuzeybatı, 1535 m, step, 23.06.2007, MNM 1328. **Endemik**. Akdeniz elementi.

A. elatus Boiss. & Balansa (1859) /Atgeveni
B5 Kayseri: Talas, 1100 m, taşlık yamaçlar, 25.08.1998, Akan 1534 & Ekici. **Endemik**. İran-Turan elementi.

A. elongatus Willd. subsp. ***nucleiferus*** (Boiss.) D.F. Chamb. (1970) / Düğmeli geven
C7 Şanlıurfa: Birecik, Zeytinbahçe doğusu, 400 m, step, 27.03.2004, MMB 236; Birecik, Bentbahçesi-Bozdere arası 2 km, 490 m, step, 27.03.2005, MMB 1191; Bozova yolu, Kalecik Dağı; Korukezen köyü kuzeybatısı, 700 m, beyaz topraklar, 14.04.2002 Aydoğdu 1015, 1085. İran Turan- elementi.

A. emarginatus Labill. (1791) / Oyuk geven (Ekler, Şekil 9)
C6 Şanlıurfa: Birecik: Bentbahçesi, 570 m, yol kenarı, 06.05.2007, MNM 1252; Şanlıurfa-Birecik 70 km, 630 m, tarla kenarı, 04.05.2008, MNM 1383; Birecik, Arat Dağı kuzey batı tepeleri, 880 m, taşlık yamaçlar, 18.05.2003, Korkut 196. İran-Turan elementi.

A. guttatus Banks & Sol.
C7 Şanlıurfa: Şanlıurfa-Viranşehir 40 km, 560 m, step, 22.04.2008, MNM 1339 & Akan, MNM 1403 & Akan. İran-Turan elementi.

A. gymnalopecias Rech. f. (1949) /Müküs geveni (Ekler, Şekil 10)
B9 Van: Çatak-Narlıce köyü, Mukus yolu 74 km, yukarı darınış deresi kenarı, Kirapit yaylası, 18.07.1998, Akan 1351. **Endemik.** İran-Turan elementi.

A. hamosus L. (1753) / Koçboynuzu (Ekler, Şekil 11)
C7 Şanlıurfa: Birecik, Arat köyü, 750 m, step, 18.05.2003, Korkut 183; Birecik, Mezra-Akarçay 3 km, 370 m, step,

11.04.2004, MMB 405; Birecik, Divriği Köyü, 760 m, step, 02.05.2004, Korkut 511; Birecik, Arat Dağı güneybatısı, vadi alanı, 760 m, step, 01.06.2004, Korkut 580; Bozova karayolu: Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1060, MNM 1109; Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3061; Aşıkköy, 600 m, step, 14.05.2001, Akan 1767, Akan 1838; Şanlıurfa-Hilvan 10 km, 23.04.2007, 550 m, yol kenarı, MNM 1182, 1185, MNM 1311; Şanlıurfa-Viranşehir karayolu 40 km, 560 m, yol kenarı, 22.04.2008, MNM 1336, MNM 1017.

A. haarbachii Spruner (1843) /Çarıkgeveni (Ekler, Şekil 19)
C7 Şanlıurfa: Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1157 & Akan.

A. oleiefolius DC. (1802) /Gazi geveni
C7 Şanlıurfa: Birecik, Arat Köyü, 880 m, taşlık alanlar, 09.10.2004, Korkut 663; Arat Dağı kuzeybatı tepeleri, Radyo istasyonu güneyi, 800 m, step, 30.08.2003, Korkut 294. İran-Turan elementi.

A. lamarckii Boiss. (1849) /Eğin geveni (Ekler, Şekil 12)
C7 Şanlıurfa: Birecik, Arat Dağı güneybatı tepeleri, 750 m, step, 18.05.2003, Korkut 205; Arat Köyü kuzey batı tepeleri, 800 m, step, 09.05.2004, Korkut 548, 640; Küçükkargılı köyü, 700 m, taşlık yamaçlar, 14.06.2001, Akan 2433; İbid., 03.07.2004, Akan 5175&Çetin. **Endemik**. İran- Turan elementi.

A. macrocephalus Willd. subsp. ***cucullaris*** **(**Boiss.) D.F. Chamb. (1970).
C8 Mardin: Zinnar mevkii, Akan 1588; Mardin: Bakırkırı, 1000 m, *Quercus* açıklıkları, 27.05.1999, Akan 1589; Mardin: Derik-Mazıdağı 1 km, 1000 m, step, 25.05.1999, Akan 1562. İran-Turan elementi.

A. macrocephalus Willd. subsp. ***finitimus*** (Bunge) D.F. Chamb. (1969) / Topaç geven
B7 Elazığ: Diyarbakır-Elazığ yolu 103 km, 1200 m, yol kenarı, 10.06.1998, Akan 1414; **C5** Adana-Ulukışla 22 km, Koçak köyü, 1100 m, 02.06.1998, Akan 1397. İran-Turan elementi.

A. macrocephalus Willd subsp. ***macrocephalus*** (1802) / Sarıponpon (Ekler, Şekil 13)
C3 İsparta: İsparta-Beyşehir yolu 10 km, Gölbaşı köyü, 1200 m, step, 10.06.1997, Akan 1241; **A4** Ankara: Beştepe, 850 m, Devlet mezarlığı içi, 01.07.1998, Akan 1462. İran-Turan elementi.

A. mardinensis Nábelek (1923) /Mardin geveni
C7 Şanlıurfa: Kalecik Dağı; Korukezen köyü, 750 m, taşlık alanlar, 24.04.2003, Aydoğdu 1200, 1245, 1402. **Endemik.** İran- Turan elementi.

A. nervulosus Hub.-Mor. (1940) / Çizgili geven
C7 Şanlıurfa: Bozova yolu, Kırkpınar köyü, 500 m, taşlık alanlar, 20.05.2003, Aydoğdu 1446. **Endemik.** İran-Turan elementi.

A. onobrychis L. (1753) /Korungageveni
C7 Şanlıurfa: Bozova yolu, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4217.

A. oocephalus Boiss. (1843) /Ata geveni (Ekler, Şekil 14)
B7 Tunceli: Pertek-Tunceli 18 km, Cankurtaran mevkii, 1350 m, çayırlıklar, 12.06.1998, Akan 1400; İbid., 28.07.1998, Akan 1483; **B9** Van: Kayapınar-Van 67 km, 1640 m, 08.06.2001, Akan 2313; **C8** Mardin: Midyat-Cizre 1 km, 900 m, tarla içi, 29.06.1998, Akan 1460; 1543. İran-Turan elementi.

A. ovabaghensis Akan & Aytaç (2004) /Bağ geveni
C8 Diyarbakır: Eşref Ağa köyü batısı, 1000 m, 9.06.1998, Akan 1412; Diyarbakır-Ovabağ 13 km, 1000 m, tarla kenarı, 28.05.1999, Akan 1592. **Endemik.** İran-Turan elementi.

A. oxyglottis M. Bieb (1808) / Irmak geveni
C7 Şanlıurfa: Karaköprü, Atatürk ormanı, güneydoğu kısımları, 740 m, 14.iv.2011, Ayaz 1317.

A. panduratus Bunge (1869) /Yurtgeveni
B4 Ankara: Aysanti geçidi, güney yamaçlar, 1250 m, 1.08.1998, Akan 1532 & Adıgüzel. **Endemik**. İran-Turan elementi.

A. petropolitanus Sheld. (1894) / Keçe geveni (Ekler, Şekil 15)
A8 Erzurum: Oltu-Şenkaya 28 km, Gözalan köyü, 1750 m, step, 28.06.1997, Akan 1294. Iran-Turan elementi.

A. ponticus Pall. (1800) / Zümra geveni (Ekler, Şekil 16)
A4 Kastamunu: Tosya Üçoluk deresi, 500 m, orman içi, 07.07.1998, Akan 475; **B2** Kütahya: Kütahya-Eskişehir yolu 15 km, Porsuk mevkii, 1000 m, yol kenarı, 01.07.1998, Akan 1461; Kütahya, Hacikebir-Çoderler, 1000 m, yol kenarı, 20.06.1996, Akan 1027; **B3** Afyon: Çay; Koçbey köyü, 1050 m, yol kenarı, 10.6.1997, Akan 1239; **B4**

Ankara: Karapürçek kavşağı mevkii, 850 m, yol kenarı, 04.07.1998, Akan 1467; **B6** Konya: Bozkır-Seydişehir arası, 1130 m, yol kenarı, 03.06.1996, Akan 1041; Sivas: İmranlı, 1650 m, mezarlık içi, 18.07.1997, Akan 1357; Sivas: Yıldızeli, Halimhanı-Kızıldereye, 1230 m, çayırlık, 25.06.1997, Akan 1268; **B8** Erzurum-Pasinler 21 km, 1800 m, tarla kenarı, 30.6.1997, Akan 1319; Aşkale-Bayburt 1 km, 1650 m, yol kenarı, 29.06.1997, Akan 1307; **B9** Ağrı: Ağrı-Erzurum 125 km, 1700 m, yol kenarı, 15.07.2002, Akan 3764; Bayburt-Gümüşhane 39 km, 1600 m, taşılk, 26.07.1996, Akan 1186,1187.

A. russelii Banks & Sol. (1974) / Ballan (Ekler, Şekil 17)
C7 Şanlıurfa: Şanlıurfa-Birecik 70 km, 630 m, tarla kenarı, 04.05.2008, MNM 1380; Birecik, Akarçay kuzey doğusu, 450 m, step, 04.04.2004, MMB 313, MMB 585, MMB 872; Birecik, Bentbahçesi-Bozdere arası 2 km, 490 m, step, 27.03.2005, MMB 1219; Birecik, Arat Dağı güneybatı tepeleri, 750 m, step, 18.05.2003, Korkut 205, Korkut 383; Birecik, Divriği köyü, 770 m, tarla kenarı, 02.05.2004, Korkut 490; Bozova yolu, Korukezen köyü, step, 750 m, 14.04.2002, Aydoğdu 1099; Nergisli köyü civarı, 745 m, yol kenarı, 29.04.2007, MNM 1214; Adıyaman: Kuyulu köyü, step, 650 m, 18.05.2003, Akan 4913. İran -Turan elementi.

A. scabrifolius Boiss. (1843) / Gövdesiz geven
C7 Şanlıurfa: Kalecik Dağı; Korukezen köyü kuzeybatısı, 750 m, taşlık alanlar, 24.04.2003, Aydoğdu 1239, 1248. **Endemik**. İran-Turan elementi.

A. suberosus Banks & Sol. (1794) / Yemeni geveni
C7 Şanlıurfa: Kalecik Dağı; Korukezen köyü kuzeybatısı, 700 m, taşlık alanlar, 17.03.2002, Aydoğdu 1027, 1028, 1029, 1031; Bozova: Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1118, MNM 1325; Yukarı İskara köyü, 690 m, yol kenarı, 26.05.2007, MNM 1314, 1359, MNM 1417&Akan; Adıyaman: Kuyulu köyü, 600 m, step, 02.05.2004, Akan 5109.

A. surugensis Boiss. & Hausskskn. (1873) / Suruçgeveni
C7 Şanlıurfa-Hilvan arası 32 km, 700 m, step, MNM 1453. İran-Turan elementi.

A. uhlwormianus Freyn & Bornm. (1890) /Hatungeveni
B7 Elazığ: Harput-Hamedi 16 km, 1080 m, boş tarlalar, 13.6.1998, Akan 1425 & Ekici. **Endemik.** İran-Turan elementi.

A. vexillaris Boiss. (1843) / Bayrak geveni
C7 Şanlıurfa: Hilvan-Siverek 15 km, Buğur köyü civarı, 580 m, kayalık yamaçlar, 26.05.2007, MNM 1309; MNM 1437. İran- Turan elementi.

CICER L. (1753) /Nohut
Cicer arietinum L. (Kültür) (1753) /Nohut
C7 Şanlıurfa: Suruç-Birecik karayolu 5 km, 630 m, tarla içi, 04.05.2008, MNM 1363; Hilvan – Siverek karayolu 15 km, 620 m, yol kenarı, 18.05.2008, MNM 1436.

C. bijugum Rech. f. (1924) / Pıtrak nohutu
C7 Şanlıurfa: Kaşmer Dağı, 600 m, step, 31.05.2002, Akan 2067. İran Turan elementi.

C. echinospermum P. H. Davis (1969) / Kirpin nohutu
C7 Şanlıurfa: Birecik, Arat Dağı güneybatısı, 760 m, tarla kenarı,01.06.2004, Korkut 586; Hilvan-Siverek 15 km, Buğur köyü, 580 m, kayalık yamaçlar, 26.05.2007, MNM 1312; Siverek girişi, 1420 m, yol kenarı, 18.05.2008, MNM 1438. **Endemik**; İran-Turan elementi.

C. pinnatifidum Jaub. & Spach (1842) / Çakıl nohutu
C7 Şanlıurfa: Viranşehir-Mardin yolu; Tek Tek Dağları Milli Parkı güney yamaçlar, 600 m, kayalık yamaçlar, 14.05.2008, MNM 1432; Bozova yolu, Kaşmer Dağı, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4218; Karaköprü, Gölpınar mesire yeri, güneydoğu kısımları, 720 m, 14.iv.2010, Ayaz 1330. Iran-Turan elementi.

CORONILLA L. (1753) / Burçak
Coronilla scorpioides (L.) W.D.J. Koch. (1837) /Akrep burçağı
C7 Şanlıurfa-Birecik, Zeytinbahçe höyük çevresi, 500 m, tarla kenarı, 24.04.2004, MMB 510, MMB 953, MMB 1261,MMB 1358, 1386; Birecik, Ziyaret tepesi, 560 m, step, 09.05.2004, MMB 816; Birecik, Arat köyü güneybatısı, 740 m, tarla kenarı, 27.04.2003, Korkut 123, Korkut 391; Birecik, Arat Dağı kuzeybatı tepeleri, 810 m, tarla kenarı, 03.04.2004, Korkut 418; Karaköprü-Bozova yolu, Kalecik Dağı; Korukezen köyü civarı, 700 m, beyaz topraklı alanlar, 19.05.2003, Aydoğdu 1417/b, Aydoğdu 1077; Kalecik dağı, Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3031, Akan 2048; Aşıkköy, 700 m, step, 23.05.2002, Akan 1969 & 1973; Bozova yolu; Maşuk köyü, 550 m, step, 23.04.2006, MNM 1056, MNM 1091; Bozova-Adıyaman; Fırat nehri kenarı, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1124; Şanlıurfa-Viranşehir 5 km, 500 m, boş alanlar, 16.04.2006, MNM

1010, MNM 1024, MNM 1150, MNM 1345; Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1210, 1355; Karaköprü, Gölpınar mesire yeri, 700 m, orman içi, 14.iv.2010, Ayaz 1214.

GALEGA L. (1753) /Sarıyıldız
Galega officinalis L. (1753) / Keçisedefi (Ekler, Şekil 21)
C7 Şanlıurfa: Hilvan-Siverek 10 km, Göktepe köyü, 585 m, birikinti su kenarı, 26.05.2007, MNM 1306. Avrupa-Sibirya elementi.

GENISTA L. (1753) /Borçak
Genista anatolica Boiss. (1843) /Kandaş dikeni
C7 Şanlıurfa: Birecik, Zeytinbahçe höyük çevresi, 450 m, tarla kenarı, 24.04.2004, MMB 542, MMB 687, MMB 701. İran-Turan elementi.

GLYCYRRHIZA L. (1753) / Meyan
Glycyrrhiza glabra L. var. **glabra** (1753) / Meyan
C6 Şanlıurfa: Birecik, Çiftlik köyü, 460 m, step, 04.05.2008, MNM 1373; Birecik, Zeytinbahçe höyük çevresi, 450 m, tarla kenarı, 24.04.2004, MMB 170, 556, 927, 1081; Birecik, Yukarı Almaşar köyü güneyi, 720 m, step, 04.07.2004, Korkut 659; Şanlıurfa-Bozova 12 km, 680 m, step, 09.06.2007, MNM 1322; Şanlıurfa-Adıyaman yolu, Karababa köprüsü civarı, 700 m, Fırat nehri kenarı, 10.05.2008, MNM 1423; Karaköprü-Bozova arası, Kalecik Dağı doğusu; Yarımtepe köyü, 700 m, 08.06.2003, Aydoğdu 1473, Kaşmer dağı, Halaç köyü, 600 m, 03.07.2004, Akan 5178 & Çetin.

HEDYSARUM L. (1753) / Batalak
Hedysarum pannosum Boiss. (1872) /Keçelibatalak (Ekler, Şekil 22)
C7 Şanlıurfa: Şanlıurfa-Bozova yolu, Kalecik Dağı: Korukezen köyü, 600 m, taşlık alanlar, 19.05.2003, Aydoğdu 1395; Kalecik Dağı; Korukezen köyü kuzeybatısı, 850 m, taşlık alanlar, 08.06.2003, Aydoğdu 1500/b; Birecik, Zeytinbahçe-Abdallı köyleri arası, 510 m, step, 01.05.2005, MMB 1384; Birecik, Bentbahçesi deresi, 480 m, dere kenarı, 19.06.2005, MMB 1433; Şanlıurfa: Şanlıurfa-Birecik karayolu 70 km, 630 m, boş alanlar, 04.05.2008, MNM 1382& Akan. İran Turan- Elementi.

H. varium subsp. ***syriacum*** (Boiss.) C.C.Towns. (1971) / Şam batalağı
C7 Şanlıurfa: Birecik, Divriği Köyü, 760 m, taşlık, 04.07.2004, Korkut 619, Bozova-Hilvan 10 km, 700 m, step, 10.05.2008, MNM 1412 & Balos, Kaşmer Dağı, Uyuzpınar köyü, 800 m, step, 31.05.2002, Akan 2064. İran-Turan elementi.

HIPPOCREPIS L. (1753) / Çiftatnalı
Hippocrepis unisiliquosa subsp. ***unisiliquosa*** L**.** (1753) / At nalı (Ekler, Şekil 23)
C7 Şanlıurfa: Birecik, Akarçay, 450 m, step, 04.04.2004, MMB 299; Birecik, Mezra-Akarçay 3 km, 370 m, step, 11.04.2004, MMB 381, 388, 459; Birecik, Bentbahçesi girişi, 530 m, dere kenarı, 01.05.2005, MMB 1371; Birecik, Divriği köyü, 760 m, step, 02.05.2004, Korkut 497; Adıyaman: Kuyulu yolu erozyon bölgesi, 900 m, step, 21.05.2002, Akan 3896; Şanlıurfa-Bozova, Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1089, MNM 1106, MNM 1226; Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1161; Haliliye, Şanlıurfa-Viranşehir 22 km, 665 m, yol kenarı, 13.05.2007, MNM 1277, MNM 1153, MNM 1018; Kalecik Dağı, Korukezen köyü kuzeybatısı, 850 m, taşlık alanlar, 14.04.2003, Aydoğdu 1500/a; Karaköprü, Atatürk ormanı, Gölpınar köyü civarı, 730 m, 14.iv.2010, Ayaz 1223.

LATHYRUS L. (1753) / Mürdümük
Lathyrus annuus L. (1753) / Dağdırılcası
C7 Şanlıurfa: Karaköprü, Gölpınar'ın kuzeyi, 730 m, 12.iv.2011, Ayaz 1278, Siverek-Şanlıurfa 5 km, 700 m, yol kenarı, 06.05.2007, MNM 1241& Akan, MNM 1243 & Akan. Akdeniz elementi.

L. aphaca L. var. ***biflorus*** Post (1896) / Sarı burçak
C7 Şanlıurfa: Bozova yolu: Maşuk köyü, 550 m, step, 23.04.2006, MNM 1053; Şanlıurfa-Hilvan 10 km, 23.04.2007, 550 m, yol kenarı, MNM 1187, 1207; Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 2997. Akdeniz-elementi

L. aphaca L. var. ***modestus*** P.H. Davis (1969) / Sarı burçak
C7 Şanlıurfa: Kalecik Dağı; Kırkpınar köyü doğusu, 650 m, taşlık alanlar, 14.04.2003, Aydoğdu, 1078, Aydoğdu 1329/a; Birecik, Arat Dağı kuzeybatı tepeleri, 800 m, beyaz taşlık alan, 09.05.2004, Korkut 542. Akdeniz elementi.

L. boissieri Širj. (1934) / Ercolban
C7 Şanlıurfa: Şanlıurfa-Siverek; Karacadağ eteği (Batı), 1200 m, tarla kenarı, MNM 1434 & Balos. İran-Turan elementi.

L. cassius *Boiss*. (1849) / Kelimirdik
C7 Şanlıurfa: Kaşmer Dağı, Kuyupınar köyü, 650 m, yol

kenarı, 31.02.2002, Akan 2026. Akdeniz elementi.
L. chrysanthus Boiss (1865) /Altın burçak (Ekler, Şekil 24)
C7 Şanlıurfa: Kaşmer Dağı, Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 3029 &3948. İran-Turan elementi.

L. cicera L. (1753) /Çolban
C7 Şanlıurfa: Birecik, Divriği Köyü, 760 m, tarla kenarı, 27.04.2003, Korkut 153; Arat Dağı güneybatısı, vadi alanı, 760 m, step, 18.05.2003, Korkut 192; Divriği Köyü yolu kenarı, 760 m, step, 02.05.2004, Korkut 485; Birecik, Zeytinbahçe höyüğü güneyi, 24.04.2004, 430 m, yol kenarı, MMB 470; Bentbahçesi girisi, 530 m, dere kenarı, 01.05.2005, MMB 1375; Şanlıurfa-Viranşehir 20 km, Osmanbey kampüsü, 520 m, step, 22.04.2006, MNM 1019; Suruç'un 3 km doğusu, 700 m, step, 08.04.2007, MNM 1165; Hilvan 10 km güneyi, 550 m, yol kenarı, 23.04.2007, MNM 1198, 1190; Şanlıurfa-Bozova 35 km, Cıbır köyü yol ayrımı, 735 m, step, 29.04.2007, MNM 1230. Akdeniz elementi.

L. inconspicuus L. var. ***inconspicuus*** (1753) /Yılan mürdümüğü
C7 Şanlıurfa, Kaşmer Dağı, Uyuzpınar köyü, 600 m, step, 31.05.2002, Akan 2023.

L. pseudocicera Pamp. (1924) / Hatun baklası
C7 Şanlıurfa: Şanlıurfa-Bozova yolu: Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1127 & Akan; Şanlıurfa-Viranşehir 37 km, 580 m, step, 13.05.2007, MNM 1270 & Balos; Şanlıurfa-Bozova yolu: Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1063, 1096 & Akan. Akdeniz elementi.

L. sativus L. (1753) /Mürdümük
C7 Şanlıurfa: Birecik, Arat Dağı, kuzeybatı tepeleri, 800 m, step, 09.05.2004, Korkut 549; Şanlıurfa-Hilvan 6 km, 675 m, yol kenarı, 20.05.2007, MNM 1299; Mezra-Akarçay arası 3 km, 370 m, step, 11.04.2004, MMB 393; Bozova yolu, Kalecik Dağı; Korukezen köyü civari, 800 m, beyaz toprak alanlar, 19.05.2003, Aydoğdu 1079/a, 1269/a, 1282, 1365; Kırkpınar köyü doğusu, 650 m, taşlık alanlar, 04.05.2003, Aydoğdu 1326; Kaşmer Dağı, Aşıkköy, 600 m, step, 14.05.2002, Akan 1803. Akdeniz elementi.

L. setifolius L. (1753) /Büllübaklası
C8 Şanlıurfa: Ceylanpınar; Karatepe Köyü, 470 m, tarla kenarı, 7.05.2008, , MNM 1398 & Akan. Akdeniz elementi.

LENS Mill. (1754) / Mercimek
Lens culinaris Medik. subsp. ***culinaris*** (1787) / Mercimek
C7 Şanlıurfa: Birecik: Bentbahçesi, 570 m, yol kenarı, 06.05.2007, MNM 1255; Bozova yolu: Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM & Akan 1068; Şanlıurfa-Hilvan 10 km, Karaköprü mevkii, 550 m, yol kenarı, 23.04.2007, MNM 1188. İran-Turan elementi.

L. culinaris Medik. subsp. ***orientalis*** (Boiss.) Ponert. (1973) / Yasmık
C7 Şanlıurfa: Birecik, Arat Dağı kuzeybatı tepeleri, 800 m, tarla kenarı, 08.06.2003, Korkut 552; İbid., 17.04.2004, Korkut 444; Birecik, Akarçay kuzey doğusu, 450 m, step, 04.04.2004, MMB 295; Birecik, Akarçay köyünün 3 km kuzeydoğusu, 430 m, dere kenarı, 06.06.2004, MMB 954, MMB 584; Bozova yolu, Kalecik Dağı; Korukezen köyü kuzeybatısı, 750 m, tarla kenarları, 24.04.2003, Aydoğdu 1270; 1262/b, Aydogdu 1286; Kalecik Dağı, Aydoğdu 1136/b; Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1143; Urfa-Viranşehir yolu, Osmanbey kampüsü kuzey yamaçlar, 500 m, step, 27.03.2007, MNM 1144, MNM 1341; Hilvan-Siverek 15 km, Buğur köyü civarı, 580 m, kayalık yamaçlar, 26.05.2007, MNM 1307; Karaköprü, Gölpınar ormanı, Yusufkuyu köyü civarı, 730 m, 14.iv.2010, Ayaz 1267; Karaköprü, Kaşmer dağı, 800 m, step, 22.05.2002, Akan 3954.

LOTUS L. (1753)/ Gazalboynuzu
Lotus aegaeus (Griseb.) Boiss. (1872) / Nohudak (Ekler, Şekil 25)
C7 Şanlıurfa: Birecik, Divriği köyü yolu, 760 m, tarla kenarı, 19.09.2004, Korkut 653; Birecik, Yukarı Almaşar köyü kuzeyi, 780 m, step, 13.06.2004, Korkut 608; Bozova, Fırat nehri kenarı, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1125; Şanlıurfa-Hilvan-Siverek 10 km, 620 m, kurumuş dere içi, 18.05.2008, MNM 1444; **C8** Şanlıurfa: Ceylanpınar; Karatepe köyü, 470 m, tarla kenarı, 07.05.2008, MNM 1395. İran-Turan elementi.

L. gebelia Vent. var. ***gebelia*** (1801) / Gülgazal boynuzu (Ekler, Şekil 26)
C7 Şanlıurfa-Hilvan, Kabahaydar, Yukarı İskara Köyü, 690 m, tarla kenarı, 29.04.2008, MNM 1357; Bozova; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1069, 1070, 1119, MNM 1324; Şanlıurfa-Bozova 20 km, 720 m, tarla kenarı, 10.05.2008, MNM 1428, MNM 1303, MNM 1305; Şanlıurfa-Siverek arası, Karacadağ'ın 5 km batısı, 1535 m, step, 23.06.2007, MNM 1327; Şanlıurfa-Viranşehir; Osmanbey Kampüsü, 503 m, step, 06.05.2008,

MNM 1390, Karaköprü, Atatürk ormanı, orman güney kısımları, 760 m, 14.iv.2010, Ayaz 1143; Kaşmer dağı, Aşıkköy, 700 m, step, 23.05.2002, Akan 2017, Akan 2054 & 2083; **C8** Şanlıurfa-Ceylanpınar; Beyazkule, 440 m, 07.05.2008, MNM 1399. İran-Turan elementi.

MEDICAGO L. (1753) / Karayonca

Medicago arenicola (Hub.-Mor.) E. Small. (1987) / Çemen yoncası (Ekler, Şekil 27)

C3 Antalya: Lara, Valilik dinlenme tesisleri, 10 m, orman açıklıkları, 17.04.2002, Akan 2801, 2821/b. **Endemik.** Akdeniz elementi.

M. astroites (Fisch. & C.A.Mey.) Trautv. (1841) / Ay yoncası

C3 Antalya: Bucak yolu, Kepez girişi, 220 m, orman açıklıkları, 23.5.2002, Akan 2808, 3314; **C4** Konya: Ereğli-Karapınar 25 km, 1600 m, çayırlıklar, 01.06.2002, Akan 3586; **C5** Aksaray: Hasan Dağı etekleri, 900 m, dağlık alanlar, 21.06.2003, Akan 4750; Adana: Ulukışla-Pozantı 6 km, 1300 m, çayırlık, 19.05.2003, Akan 4561, Akan 4567; **C6** Şanlıurfa: Birecik-Halfeti arası, Tektaş köyü, 480 m, çayırlıklar, 05.05.2002, Akan 3116; Birecik, Ziyaret tepesi-Zeytinbahçe arası, 500 m, step, 09.05.2004, MMB 863; Gaziantep-Şanlıurfa 8 km, 850 m, yol kenarı, 08.06.2003, Akan 4708; **C7** Şanlıurfa-Hilvan 8 km, Canbeyli tesisleri civarı, 700 m, yol kenarı, 20.05.2003, Akan 4583, Akan 2906, Akan 5265; Şanlıurfa: Bozova yolu, Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1138, MNM 1064, MNM 1235. İran-Turan elementi.

M. biflora (Griseb.) E. Small (1987) / İkiz yonca (Ekler, Şekil 28)

C2 Burdur-Gölhisar 10 km, 1200 m, step, 30.5.2002, Akan 3499; Burdur-Elmalıyurt 1 km, 1150 m, orman açıklığı, 28.05.2003, Akan 4645; **C3** Antalya-Elmalı; Korkuteli, 1000 m, kalker yamaçlar, 30.05.2002, Akan 3516; Denizli-Honaz Dağı 3 km, 975 m, orman içi, 29.5.2002, Akan 3457; **C5** Adana-Çiftehan 8 km, 850 m, taşlık yamaçlar, 08.06.2003, Akan 4687; Ulukışla-Pozantı 19 km, 1300 m, çayırlık, 01.06.2002, Akan 3594, Akan 4693. İran- Turan elementi.

M. brachycarpa Fisch. (1819) /Küme yonca

A4 Ankara: Beştepe; Atatürk ormanı, 850 m, çayırlık, 24.5.2003, Akan 4586; Ankara-Eskişehir yolu 5 km, 850 m, çayırlık, 24.05.2003, Akan 4592; **B2** Konya-Akşehir, Şahören köyü, 1165 m, yol kenarı, 22.06.2003, Akan 4754; **C2** Muğla-Kale 7 km, 910 m, orman açıklıkları, 28.05.2002, Akan 3445; Burdur: Dirmil-Elmalı 12 km, 1250 m, orman açıklığı, 28.05.2005, Akan 4641; **C3** Isparta-Şarkikaraağac 15 km güneyi, Çetince kasabası, 1050 m, çayırlıklar, 31.05.2002, Akan 3552; **C4** İçel-Güzelyayla; Değirmendere, Güzelyayla'ya 5 km kala, 790 m, çayırlıklar, 18.5.2003, Akan 4544, Akan 4552; Konya-Hadım-Karaman 15 km, 850 m, yol kenarı, 17.07. 2002, Akan 3801; Akarköy, 1150 m, yol kenarı, 30.05.2003, Akan 4674; **C5** Adana: Pozantı-Gülek Boğazı 25 km, 830 m, çayırlık, 01.06.2002, Akan 3601, 3602, 3604, 4700, Akan 4742, Akan 4686; Mersin-Tarsus 30 km, taşlık alanlar, 21.5.2002, Akan 329; **C6** Hatay-İskenderun, Belen, 300 m, çayırlık, 17.05.2003, Akan 4521; **B5** Niğde-Ulukışla 5 km, 1300 m, yol kenarı, 16.07.2002, Akan 3780. İran-Turan elementi.

M. carica (Hub.-Mor.) E. Small. (1987) / Muğla yoncası

C2 Muğla: Marmaris, İnişdibi köyü üstleri 150 m, orman açıklığı, Akan 2829, 3366. **Endemik.** Akdeniz elementi.

M. crassipes (Boiss.) E. Small. (1987) /Hançer yoncası

B2 Uşak: Kayagöl Köyü 4 km, 900 m, yol kenarı, 24.05.2003, Akan 4611; **Cl** Aydın: Geyra-Kale; Dünberak köprüsü, 950 m, çayırlık, 28.05.2002, Akan 3436; **C2** Denizli: Geyra-Babadağ 12 km, 1200 m, çayırlıklar, 28.5.2002, Akan 3434; Denizli-Honaz Dağı 7 km, 1200 m, orman açıklığı, Akan 3452; Burdur: Dirmil geçidi, 30.05.2002, Akan 3512; Burdur: Salda Gölü; Sultan pınar tesisi, 1150 m, göl kenarı, 29.05.2002, Akan 3464; Muğla: Kale'nin 16 km güneyi, Beybahçe yol ayrımı, 25.05.2002, 110 m, taşlık alanlar, Akan 3386, 3444, Akan 3389; **C3** Antalya: Hafizpaşa çıkışı, 750 m, makilik, 23.05.2002, Akan 3325, 3325; Antalya: Elmalı; Gömbe Çobanlar mahallesi, 1300 m, yamaçlar, 28.05.2003, Akan 4635, Akan 4644; Burdur-Antalya arası 5. km, 1100 m, korunmuş alan, 30.05.2002, Akan 3542; **C4** Karaman: Ayrancı, Kayaönü köyü üstü, 1600 m, step, 01.06.2002, Akan 3578; **C5** Aksaray-Hasan Dağı etekleri 28 km güneyi, 1145 m, step, 19.04.2003, Akan 4573; Niğde: Ulukışla'nın 5 km doğusu, 1300 m, korunmuş alan, 08.06.2003, Akan 4692; **C6** Adana: Pozantı-Aksaray 64 km, 1160 m, çayırlık, 19.05.2003, Akan 4565; Osmaniye-Bahçe 17 km, 400 m, çayırlık, 21.04.2002, Akan 2868; Gaziantep: Yavuzeli; Dülük köyü, 860 m, çayırlık, 21.04.2002, Akan 2875; **C7** Şanlıurfa-Suruç 20 km, 550-600 m, yol kenarı, 18.05.2002, Akan 3201; Şanlıurfa-Gaziantep arası 6 km, 750 m, yol kenarı, 07.04.2002, Akan 2623, 2617, 2621; Şanlıurf-Bozova yolu: Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1111 & Akan. İran-Turan elementi.

M. coronata (L.) Bartal. (1776) /Gevşekyonca
C7 Şanlıurfa-Viranşehir 45. km, 665 m, step-kayalık, 13.05.2007, MNM 1258, MNM 1347; Kaşmer Dağı, Aşıkköy, 700 m, step, 14.05.2001, Akan 1768, 1944. Akdeniz elementi.

M. fischeriana (Ser.) Trautv (1841) / Mızrak yonca (Ekler, Şekil 29)
A9 Kars-Kağızman; Cumaçay 26 km, 1800 m, çayırlık, 14.07.2002, Akan 3743; **B5** Kayseri: Ali Dağı kuzey Doğu, 1350 m, yol kenarı, 8.7.2002, Akan 3654, 3657, 3662; **Cl** Aydın-Gheyra 10 km, 500 m, step, 28.5.2002, Akan 3427; **C2** Mulağ-Gölhısar 10 km, 950 m, ağaçlandırma sahası, 30.5.2002, Akan 3485; Burdur: Gölhisar-Dirmil 10 km, 1200 m, serpantin, 30.5.2002, Akan 3495; Muğla-Kale, Göktepe yolu 7 km, 1000 m, çalılık, 25.5.2002, Akan 3371; **C3** İsparta: Karaağac'ın 15 km güneyi, 1050 m, çayırlıklar, 31.05.2002, Akan 3548; Antalya-Serik, Kumköy, 5 m, kumsal, 22.5.2002, Akan 3305; Burdur: Tefenni-Çavdır 10 km, 1200 m, step, 29.05.2002, Akan 3472; İsparta: Çiçekli Daığ üst kesimleri, 1050 m, 31.05.2002, Akan 4559; **C4** Konya: Konya'nın 20 km batısı, 1470 m, 29.05.2003, Akan 4676; Konya-Ereğli 25 km, 1000 m, step, 01.06.2002, Akan 3589, 3588; **C5** Niğde: Ulukışla'nın 5 km doğusu, 08.06.2003, 1300 m, Akan 3590, 4690, Akan 4744. İran-Turan elementi.

M. granadensis Willd. (1809) / Sıtri
C7 Şanlıurfa: Birecik, Zeytinbahçe, 480 m, çayırlık, 01.05.2005, MMB 1274. Akdeniz elementi.

M. halophila (Boiss.) E. Small. (1987) /Çorak yoncası
C5 Mersin: Tarsus, Egemen köyü, 160 m, meşe açıklıkları, 20.04.2002, Akan 2850, 2856, 4555. **Endemik.** Akdeniz elementi.

M. huberi E. Small. (1987) / Horoz yoncası
C2 Burdur-Salda Gölü civarı, 1150 m, 29.05.2002, Akan 3465. **Endemik.** Akdeniz elementi.

M. isthmocarpa (Boiss. & Balansa) E.Small
B5 Aksaray: Hasan Dağı, 900 m, yol kenarı, 21.06.2003, Akan 4751; **B5** Aksaray: Aksaray'ın 28 km güneyi, 1145 m, step, 19.04.2003, Akan 4569. **Endemik.** İran-Turan elementi.

M. lupulina L. (1753) /Bitçikotu
C7 Şanlıurfa: Birecik, Arat köyü, 740 m, tarla kenarı, 27.04.2003, Korkut 118, Korkut 382/a; Birecik, Arat Köyü güney tepeleri, 860 m, tarla kenarı, 06.04.2003, Korkut 11, Korkut 38, Korkut 361; Şanlıurfa-Suruç 6 km, 05.05.2002, 660 m, çayırlık, Akan 3078; Kaşmer Dağı, Öğütçü köyü, 700-800 m, 02.05.2002, step, Akan 3041.

M. monspeliaca (L.) Trautv.
C6 Gaziantep: Gaziantep-Şanlıurfa 1 km, 950 m, yol kenarı, 18.5.2002, Akan 3218, 3216; Dülükbaba ormanı, 1000 m, orman açıklığı, 18.05.2002, Akan 3228; Osmaniye-Gaziantep 83 km, 550 m, çayırlıklar, 21.04.2002, Akan 2867; Şanlıurfa-Birecik 29 km, 500 m, çayırlık, 5.5.2002, Akan 3104, 3109, MMB 301, MMB 810; Birecik, Arat köyü güneybatısı, 740 m, step, 27.04.2003, Korkut 137; Adıyaman: Gerger'e 4 km, 570 m, meşelikler, 12.05.2002, Akan 3196; Adıyaman-Kuyulu 70 km, 575 m, erozyon alanı, 30.04.2002, Akan 2953, Akan 2954; **C7** Şanlıurfa-Suruç 6 km, 660 m, çayırlık, 05.05.2002, Akan 3070, 3083, 3084, 3126; Suruç, Payamlı, 600 m, step, 20.05.2003, Akan 4577,4577/a 4579; Hilvan-Şanlıurfa 8 km, yol kenarı, 600 m, step, 20.05.2003, Akan 2713, Akan 2714; Akan 2894, Akan 2903, Akan 2912, Akan 4004, Akan 4006, Akan 4010, Akan 4584; Bozova yolu, Tektaş köy yol ayırımı, 720 m, tarla kenarı, 13.05.2006, MNM 1090, MNM 1304; Kalecik Dağı: Kırkpınar köyü doğusu, 600 m, taşlık alanlar, 04.05.2003, Aydoğdu 1350 &1325/a; Urfa-Viranşehir yolu, Karakuş köyü, Tektek dağları, 580 m, 22.04.2003, Akan 4508; Tektek Dağları, 600 m, yamaçlar, 29.05.2003, Akan 4723, MNM 1020, 1343; Karaköprü, Kaşmer dağı, Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 2993, 1854; 3949 & 3969, 2883. İran-Turan elementi.

M. medicaginoides (Retz.) E. Small. (1987) / Som yonca
A5 Samsun: Merkez, 550 m, step, 12.06.2003, Akan 4718; **A9** Kars: Kağızman-Cumaçay 26 km, 1800 m, çayırlık, 14.7.2002, Akan 3742; **B4** Ankara-Eskişehir 5 km, yol kenarı, 850 m, 24.05.2003, Akan 4588; **C2** Burdur-Gölhisar Dirmil 10 km, 1200 m, 30.05.2002, Akan 3504; Denizli-Honaz Dağı 3 km, 975 m, orman açıklığı, 28.5.2002, Akan 3455; **C3** Antalya-Elmalı, 1300 m, 30.05.2003, Akan 3528; **C4** Konya-Ereğli Karapınar köyü, 1600 m, step, 01.06.2002, Akan 3548; Konya-Beyşehir 27 km, 140 m, yol kenarı, 29.05.2003, Akan 4658; **C5** Adana: Kozan -Feke 35 km, Ak köyü, 850 m, 20.05.2002, Akan 3262. **A9** Kars: Kağızman, Esenler, 1250 m, yol kenarı, 13.07.2002, Akan 3723; Kars-Kağızman 23 km, 1400 m, çakıllı alan, 13.07.2002, Akan 3719; Kars: Kağızman-Cumaçay 26 km, 1800 m, çayırlık, Akan 3746; Ağrı: Doğubeyazıt-Çaldıran 20 km, 1950 m, step, 14.7.2002, Akan 3758. İran-Turan elementi.

M. marina L. (1753) / Sahil yoncası
C3 Antalya: Belek, 10 m, kumsal alanlar, 13.04.2003, Kaya 3; Belek sahil alanı, 13.04.2003, Kaya 5, 6, 16, 24; **C5** Mersin: Viranşehir, 0-10 m, kumsal alanlar, 20.04.2002, Akan 2842. İran-Turan elementi.

M. minima (L.) Bartal. var. ***minima*** (1776) / Gurnik
C6 Şanlıurfa: Birecik-Nizip 4 km, 380 m, yol kenarı, 18.05.2002, Akan 3208; **C7** Şanlıurfa: Kalecik Dağı; Kalecik mezrası çevresi, 900 m, taşlık alanlar, 23.05.2002, Aydoğdu 1105, 1127, 1128; Kalecik Dağı; Korukezen köyü kuzeybatısı, taşlık alanlar, 780 m, 24.04.2003, Aydoğdu 1281/a, Aydoğdu 1469, 1457; Birecik, Divriği Köyü yolu kenarı, 740 m, tarla kenarı, 01.06.2004, Korkut 569; Haliliye, Osmanbey kampüsü, 500 m, step, 22.04.2006, MNM 1032 & Akan; Bozova-Adıyaman, Karababa köprüsü, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1142 & Akan, MNM 1221 & Balos; Şanlıurfa-Hilvan karayolu 10 km, Karaköprü mevkii, 550 m, yol kenarı, 23.04.2007, MNM 1201, MNM 1294&MMB.

M. monantha (C.A.Mey.) Trautv (1841) / Dağgurniği
C6 Şanlıurfa: Birecik-Nizip 4 km, 380 m, çayırlık, 18.5.2002, Akan 3206; Hatay: Belen otoban altı, 300 m, çayırlık, 17.05.2003, Akan 4522; Hatay: Yayla Dağ (Kel Dağı), 1025 m, çayırlık, 17.05.2003, Akan 4537, Akan 3247; Hatay-Yayladağ 13 km, 420 m, çayırlık, 17.05.2003, Akan 4534, Akan 4532; İskenderun-Arsuz yol ayrımı 10 m, çayırlık, 15.04.2002, Akan 2778/a; İskenderun-Belen, yol kenarı, 100 m, 15.04.2002, Akan 2783; **C7** Şanlıurfa: Birecik, Yukarı Almaşar kuzeyi, 780 m, kaya üstleri, 13.06.2004, Korkut 605, Korkut 382/b; Birecik, Akarçay doğusu, 450 m, step, 04.04.2004, MMB 302, MMB 874; Birecik, Ziyaret tepesi-Abdallı köyü, 550 m, step, 01.05.2005, MMB 1342, 1443; Birecik, Zeytinbahçe höyük çevresi, 450 m, tarla kenarı, 24.04.2004, MMB 536, MMB 475; Haliliye, Osmanbey kampüsü kuzey yamaçlar, 500 m, step, 27.03.2007, MNM 1146, MNM 1152, MNM 1001; Haliliye, Osmanbey kampüsü, 520 m, step, 22.04.2006, MNM 1012, 1013, 1016, 1033, 1391, 1344 &Akan; Bozova yolu, Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1103, 1104, 1105, 1115 &, 1121, 1061, 1093 &Akan; Şanlıurfa-Bozova 30 km, Korukezen köyü, 700 m, yol kenarı, 29.04.2007, MNM 1236, Aydoğdu 1080, Aydoğdu 1218/b, Aydoğdu 1139/a;, MNM 1209, Aydoğdu 1470/a; Karaköprü, Gölpınar mesire yeri, Yaylacık köyü civarı, 740 m, 20.v.2012, Ayaz 1023; Şanlıurfa-Suruç karayolu 3. km, 700 m, step, 08.04.2007, MNM 1167 & Akan; Siverek-Diyarbakır 7 km, 1100 m, yol kenarı, 06.05.2007, MNM 1239 & Akan; Kaşmer Dağı, Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 3030. İran-Turan elementi.

M. noeana Boiss. (1856) /Çevrince
C7 Şanlıurfa: Bozova yolu; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1139, 1071, 1072; Bozova yolu, Kalecik Dağı: Korukezen köyü kuzeybatısı, 700 m, taşlık alanlar, 24.04.2003, Aydoğdu 1229/b0; Birecik, Arat Dağı kuzeybatı tepeleri, 780 m, step, 03.04.2004, Korkut 415; Şanlıurfa-Viranşehir 37 km, 580 m, step, 13.05.2007, MNM 1275. İran Turan elementi.

M. orbicularis (L.) Bartal. (1776) /Paralık (Ekler, Şekil 30)
C6 Şanlıurfa: Birecik, Bentbahçesi girisi, 532 m, dere kenarı, 01.05.2005, MMB 1369, 1273; Birecik, Mezra-Akarçay 3 km, 370 m, step, 11.04.2004, MMB 406, 527; Birecik, Divriği Köyü 760 m, yolu kenarı, 02.05.2004, Korkut 495; **C7** Adıyaman: Kuyulu köyü, 600 m, yol kenarı, 02.05.2004, Akan 5129; Viranşehir yolu, Tektek dağı, 650 m, kayalık alanlar, 14.05.2003, Akan 4519; Bozova yolu, Kalecik Dağı, Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1130, Aydoğdu 1109; Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1183, MNM 1291.

M. orthoceras (Kar. & Kir.) Trautv. (1877) / Şerit yonca
A9 Kars: Kağızman, Sarıkoç köyü, 1250 m, yol kenarı, 13.07.2002, Akan 3722, 3724, 3732, 3738; Kafkas Üniversitesi, 1750 m, çayırlık, 13.7.2002, Akan 3710; Kağızman-Cumaçay 26 km, 14.7.2002, 1800 m, çayırlık, Akan 3744; Ardahan-Kars 53 km, 2000 m, step, 12.7.2002, Akan 3707; **B3** Eskişehir: Çifteler; Abbas Selim paşa köyü, 900 m, dere kenarı, 19.7.2002, Akan 3809; **B5** Adana: Pozantı-Aksaray 64 km, 1160 m, çayırlık, 19.04.2003, Akan 4568; Kayseri: Erciyes dağı, 1550 m, step, 08.07.2002, Akan 3658; Kayseri: Ali Dağı etekleri, 1300 m, step, 8.7.2002, Akan 3660; Niğde-İncesu 80 km, 1320 m, step, 16.7.2002, Akan 3774; **B9** Ağrı: Doğubeyazıt-Iğdır yolu 9 km, 1550 m, yol kenarı, 14.07.2002, Akan 3756; **Cl** Aydın: Gheyra; Kale dünberak köprüsü, 1300 m, çayırlık, 28.5.2002, Akan 3437; **C3** Isparta: Çiçek Dağı, Gedikli, 1350 m, orman altı, 30.5.2002, Akan 3558, Akan 3571; **C7** Şanlıurfa-Birecik 1 km, 18.05.2002, 400 m, yol kenarı, Akan 3213; İran-Turan elementi.

M. pamphylica (Hub.-Mor. & Sirj.) E. Small. (1987) / Ebem yoncası
C3 Antalya-Bucak 50 km, Hafızpaşa civarı, 880 m, makilik, 23.5.2002, Akan 3331. **Endemik.** Akdeniz elementi.

M. phrygia (Boiss. & Balansa) E. Small. (1987) / Uşak yoncası
B4 Ankara-Eskişehir 5 km, 900 m, çayırlık, 24.05.2003, Akan 4589; **C3** Antalya-Gömbe, Çobanlar mahallesi, 1350 m, yamaçlar, 28.05.2003, Akan 4636; Antalya-Serik; Kumköy, 5 m, kumsal alnalar, 16.4.2002, Akan 3306; Antalya-Elmalı 12 km, 1250 m, orman açıklığı, 28.05.2003, Akan 4640; Antalya-Hafızpaşa, 880 m, step, 23.05.02, Akan 3977; Elmalıyurt-Dirmil 1 km, 1150 m, orman içi, 28.05.2003, Akan 4643; **C5** Aksaray: Hasan Dağı, 900 m, yol kenarı, 21.06.2003, Akan 4745; Aksaray: Aksaray'ın 28 km güneyi, 1145 m, step, 19.04.2003, Akan 4572, Akan 4696; **C6** Hatay-Akra Dağ; Teknecik Karakolu-Suriye hudut Karakolu 1185 m, meşelik, 19.05.2002, Akan 3230; **C7** Şanlıurfa-Bozova; Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1112, 1133; Karaköprü, Gölpınar Atatürk ormanı, 780 m, orman açıklıkları, 14.iv.2010, Ayaz 1273. İran Turan- elementi.

M. polymorpha L. var. ***polymorpha*** (1753) /Kara yonca
C7 Şanlıurfa: Birecik, Zeytinbahçe höyük çevresi, 450 m, yol kenarı, 24.04.2004, MMB 534, 546, 568, MMB 152; Birecik, Mezra-Akarçay 3 km, 370 m, kayalıklar, 11.04.2004, MMB 418; Birecik, Mezra çıkısı, 500 m, 465 m, nehir kenarı, 09.05.2004, MMB 720.

M. polymorpha L. var. ***vulgaris*** (Benth.) Shinners (1956) / Kara yonca
C7 Şanlıurfa: Birecik, Mezra-Akarçay 3 km, 370 m, step, 11.04.2004, MMB 372; Bozova yolu, Kırkpınar köyü doğusu, 500 m, taşlık alanlar, 25.05.2003, Aydoğdu 1464.

M. radiata L**.** (1753) /Hilâl yonca
C6 Şanlıurfa: Birecik; Bentbahçesi girisi, 530 m, dere kenarı, 01.05.2005, MMB 1368, MMB 531; Korkut 189, Korkut 492; **C7** Şanlıurfa-Suruç 20 km, 665 m, orman içi, 08.04.2007, MNM 1174; Şanlıurfa: Bozova yolu: Tektaş köyü yol ayrımı, 13.05.2006, 720 m, tarla kenarı, MNM 1080, MNM 1231, MNM 1192; Şanlıurfa: Kalecik Dağı: Kalecik mezrası çeviresi, 900 m, taşlık alanlar, 23.05.2002, Aydoğdu 1168/b; Kaşmer Dağı, Uyızpınar köyü, 700 m, tarla kenarı, 02.05.2002, Akan 3037; Karaköprü, Yusufkuyu köyü yakınları, 720 m, step, 14.iv.2010, Ayaz 1014, Şanlıurfa-Viranşehir karayolu 37 km, 580 m, step, 13.05.2007, MNM 1269&Balos, MNM 1408 & Akan. İran-Turan elementi.

M. rhytidiocarpa (Boiss. & Balansa) E. Small (1987) / Buruşuk yonca
C5 Niğde: Ulukışla-Pozantı 5 km, 1300 m, step, 01.06.2002, Akan 3590/b, 3590, 4691; Ulukışla'nın 5 km doğusu, 900 m, yol kenarı, 21.06.2003, Akan 4743. **Endemik.** İran-Turan elementi.

M. *rigida* (Boiss. & Balansa) E. Small. (1987) /Adana yoncası
C5 Adana: Pozantı-Gülek Boğazı, 900 m, tarla kenarı, 21.06.2003, Akan 4737; Adana: Pozantı- Çiftehan 8 km, 850 m, taşlık yamaçlar, 08.06.2003, Akan 4683. **Endemik.** Akdeniz elementi.

M. rigidula (L.) All. var. ***rigidula*** (1785) /Kaba yonca
C7 Şanlıurfa: Birecik, Bentbahçesi- Bozdere arası 2 km, 490 m, tarla kenarı, 27.03.2005, MMB 1181, MMB 300, MMB 401, MMB 469, 539, MMB 1372, MMB 865; Birecik, Arat Dağı kuzeybatı tepeleri, Radyo istasyonu civarı, 800 m, 03.04.2004, Korkut 404, Korkut 450; Şanlıurfa: Bozova yolu; Kızlar köyü civarı, 720 m, tarla kenarı, 13.05.2006, MNM 1110; Bozova yolu, Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1114; Şanlıurfa-Adıyaman, Karababa köprüsü, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1131; Şanlıurfa: Kalecik Dağı:700 m, 08.06.2003, Aydoğdu 1484; Şanlıurfa: Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1158; Karaköprü, Gölpınar köyü civarı, 730 m, step, 14.iv.2010, Ayaz 1084; Şanlıurfa-Hilvan karayolu 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1292, 1186; Viranşehir yolu, Osmanbey kampüsü kuzey yamaçlar, 500 m, step, 27.03.2007, MNM 1145, MNM 1003, MNM 1009 & Akan, MNM 1011, MNM 1342.

M. rigidula (L.) All. var. ***submitis*** (Boiss.) Ponert (1973) / Kaba yonca
C7 Şanlıurfa: Birecik, Bentbahçesi, 530 m, dere kenarı, 01.05.2005, MMB 1373; Urfa-Viranşehir yolu 20 km, 800 m, 20.05.2002, Akan 4101. İran-Turan elementi.

M. rostrata (Boiss. & Balansa) E. Small. (1987) / Niğde yoncası
B2 Konya: Konya'nın 20 km batısı, 1470 m, step, 29.5.2003, Akan 4661; **C2** Burdur- Antalya 5 km, 1250 m, tarla kenarı 30.05.2002, Akan 3537. **Endemik** İran-Turan elementi.

M. rotata Boiss. subsp. ***eliezeri*** **(**Eig) Ponert (1973) /Topaç yonca
C7 Şanlıurfa, Kaşmer Dağı, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4208. Akdeniz elementi.

M. sativa L. subsp. ***sativa*** (1753) / Kara yonca
C7 Şanlıurfa: Şanlıurfa-Suruç 30 km, 620 m, step, 04.05.2008, MNM 1365; Birecik, Zeytinbahçe, 450 m, yol kenarı, 19.06.2005, MMB 1467, MMB1487; Şanlıurfa-Hilvan 6 km, 675 m, yol kenarı, 20.05.2007, MNM 1302; Viranşehir-Ceylanpınar 35 km, 435 m, yol kenarı, 01.07.2007, MNM 1331, MNM 1397.

M. shepardii Post ex Boiss. (1888) / Antep yoncası
C7 Şanlıurfa: Kaşmer Dağı, Dolamaç tepe, 700 m, 22.05.2001, Akan 4214, Aşıkköy, 880 m, step, 14.05.2001, Akan 1844. **Endemik.** İran- Turan elementi.

M. turbinata L. (All.) (1785) /Boncuk yonca
C7 Şanlıurfa: Kaşmer Dağı, Aşıkköyü, 880 m, 14.05.2001, Akan 1855. İran-Turan elementi.

M. x varia Martyn (1792) / Yaban yoncası
C3 Antalya: Hafızpaşa-Bucak 5 km, 880 m, taşlık yamaçlar, 23.05.2002, Akan 3336. Akdeniz elementi.

MELILOTUS L. (1753) /Taş Yoncası
Melilotus indicus (L.) All. (1785) / Otuzlu yonca
B4 Ankara: Ankara-Afyon 107 km, 1000 m, tarla kenarı, 24.05.2003, Akan 4599; **C2** Burdur: Tefenni, 1150 m, korunmuş alan, 29.05.2002, Akan 3479; Burdur, Salda gölü, Sultanpınar tesisleri civarı, 1150 m, göl kenarı, 29.05.2002, Akan 3462; **C3** Antalya: Elmalı-Korkuteli 34 km, 1250 m, tarla kenarı, 30.05.2002, Akan 3533, 3518; **C6** Hatay: Hatay-İskenderun arası, hava alanı civarı, 5-10 m, çayırlıklar, 15.04.2002, Akan 2778, Akan 2773; Adana-Ceyhan 12 km, 70 m, yol kenarı, 20.05.2002, Akan 3272; **C7** Şanlıurfa: Birecik'in 1 km doğusu, 380 m, çayırlık, 18.05.2002, Akan 3209; Urfa-Mardin yolu, Tektek Dağıları, Karakuş köyü, 600 m, 29.05.2003, Akan 4722; Hilvan-Siverek 15 km, Buğur köyü civarı, 580 m, kayalık yamaçlar, 26.05.2007, MNM 1310. Akdeniz elementi.

M. officinalis (L.) Desr. (1796) / Kokulu yonca
C7 Şanlıurfa: Birecik, Zeytinbahçe güneyi, 430 m, yol kenarı, 24.04.2004, MMB 477, 489, MMB 747, MMB 1275, Karaköprü, Atatürk ormanı, orman güney kısımları, 740 m, step, 14.iv.2010, Ayaz 1061.

ONOBRYCHIS L. (1754) / Korunga
Onobrychis aequidentata (Sm.) d'Urv. (1822) / Dişlek korunga
C7 Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1179; Şanlıurfa-Bozova, Nergisli köyü civarı, 745 m, yol kenarı, 29.04.2007, MNM 1219; Kaşmer Dağı, Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3062 & 3045. Akdeniz elementi.

O. altissima Grossh. (1929) /Boylu korunga
C7 Şanlıurfa: Kalecik, Dağı, Kalecik köyü, 900 m, step, 23.05.2002, Aydoğdu 1157. İran-Turan elementi.

O. caput-galli (L.) Lam. (1779) / Pıtrak korunga
C7 Şanlıurfa-Bozova yolu: Maşuk bölgesi, 550 m, step, 23.04.2006, MNM 1052; Şanlıurfa: Bozova 35 km, Cıbır köyü yol ayrımı, 735 m, step, 29.04.2007, MNM 1233, MNM 1085; Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1160; Şanlıurfa-Viranşehir 37 km, 580 m, kayalık, 13.05.2007, MNM 1267, 1282; İbid., 22.04.2008, MNM 1346, MNM 1006; Kaşmer Dağı, Aşıkköy, 600 m, step, 14.05.2001, Akan 1775; İbid., 23.05.2002, Akan 1953. Akdeniz elementi.

O. crista-galli (L.) Lam. (1779) / Tez korunga
C7 Şanlıurfa: Birecik, Bentbahçesi girisi, 530 m, dere kenarı, 01.05.2005, MMB 1360, MMB 367, 458, MNM 1254 & Balos; Birecik, Bozdere köyü, 490 m, step, 27.03.2005, MMB 1260; Birecik, Çiftlik Köyü, 460 m, step yamaçlar, 04. 05.2008, MNM 1371& Akan; Karaköprü, Gölpınar ormanı, Yaylacık köyü civarı, 740 m, step,14. iv.2010, Ayaz 1029. Akdeniz elementi.

O. galegifolia Boiss. (1843) /Darp korungası (Ekler, Şekil 31)
C7 Şanlıurfa-Birecik 15 km, 790 m, yol kenarı, 03.06.2007, MNM 1318; Şanlıurfa: Maşuk köyü-Kurt köyü arası, 678 m, yol kenarı, 20.05.2007, MNM 1284; Şanlıurfa-Bozova 25 km, 700 m, yol kenarı, 10.05.2008, MNM 1414; Kaşmer Dağı, Aşıkköy, 700 m, step, 14.05.2002, Akan 1792. İran-Turan elementi.

O. kotschyana Fenzl. (1842) / Halep korungası
C7 Şanlıurfa: Birecik, Arat Dağı, Kuzeybatı tepeleri, 840 m, step, 08.06.2003, Korkut 211; Şanlıurfa-Birecik 70 km, 630 m, tarla kenarı, 04.05.2008, MNM 1387 Akan & Balos; Karaköprü, Atatürk ormanı, Gölpınar ormanı, 770 m, 12.iv.2011, Ayaz 1113; Şanlıurfa: Şanlıurfa-Bozova yolu: Maşuk köyü, 550 m, step, 23.04.2006, MNM 105, MNM 1117 & Akan; Şanlıurfa-Bozova: Kaşmer dağı, 770 m, step, 20.05.2007, MNM 1286; Aşıkköy, 880 m, step, 14.05.2001, Akan 1846, Akan 3946; Korukezen köyü, step, 780 m, 24.04.2003, Aydoğdu 1275; Şanlıurfa-Viranşehir; Osmanbey Kampüsü kuzey yamaçları, 545 m, step alanlar,

28.04.2008, MNM 1354; Şanlıurfa-Suruç karayolu 30. km, 620 m, step, 04.05.2008, MNM 1361 Akan & Balos. İran-Turan elementi.

O. megataphros Boiss. (1843) /Bağ korungası
C7 Şanlıurfa: Birecik, Zeytinbahçe-Adacık 3 km, 460 m, step, 28.07.2004, MMB 1128, MMB 1056; Bozova yolu, Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1116. İran-Turan elementi.

O. oxyodonta Boiss. var. ***armena*** (Boiss. & Huet) Aktoklu (2012) /Kır korungası
C6 Şanlıurfa: Birecik, Divriği köyü, 760 m, step, 01.06.2004, Korkut 560; **C7** Şanlıurfa-Bozova, Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1087, MNM 1102, MNM 1290, Kalecik Dağı, Kırkpınar köyü, 600 m, step, 25.05.2003, Aydoğdu 1424, Aydoğu 1407.

O. podperae Širj. (1925) /Tüylü korunga
C7 Şanlıurfa: Kalecik dağı, Korukezen köyü, 800 m, taşlık, 08.06.2003, Aydoğdu 1493. **Endemik.** İran-Turan elementi.

ONONIS L. (1753) / Kayişkiran
Ononis adenotricha Boiss. (1843) / Kara yandırak
C7 Şanlıurfa: Karaköprü, Gölpınar ormanı, 730 m, 14.iv.2010, Ayaz 1125. Akdeniz elementi.

O. spinosa L. subsp. ***leiosperma*** (Boiss.) Sirj. (1932) / Demirdelen
C7 Şanlıurfa-Siverek: Karacadağ-Karabahçe 5 km, 1535 m, yol kenarı, 23.06.2007, MNM 1330; Karaköprü, Kaşmer Dağı, Uyuzpınar köyü üstkısimları, 800 m, yol kenarı, 31.05.2002, Akan 2082, Akan 2012&4211, Akan 2440, 1528; Suruç-Birecik 5 km, Ezgil Köyü, 04.05.2008, MNM 1385; Kalecik köyü, 900 m, step, 23.05.2002, 630 m, tarla kenarı, Aydoğdu 1168/a, Aydoğdu 1435; Birecik, Bentbahçesi, 480 m, yol kenarı, 20.06.2005, MMB 1528.

O. viscosa L. subsp. ***sicula*** (Guss.) Hub.-Mor. (1970) / Sidikli siyek
C6 Şanlıurfa: Eski Halfeti, 395 m, dere içi, 25.04.2008, MNM 1353. Akdeniz elementi.

PISUM L**.** (1753) **/** Bezelye
Pisum sativum L. /Bezelye
C7 Şanlıurfa: Kalecik Dağı; Korukezen, 750 m, taşlık, 14.04.2002 Aydoğdu 1088, Aydoğdu 1147, Adodğdu 1322; Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1196, MNM 1288,1289; Şanlıurfa-Siverek 5 km güneyi, 700 m, yol kenarı, 06.05.2007, MNM 1244; Adıyaman; Karababa köprüsü civarı, 700 m, Fırat nehri kenarı, 10.05.2008, MNM 1422; Şanlıurfa: Karaköprü, Gölpınar mesire alanı, 740 m, 11.iv.2012, Ayaz 1031.

P. fulvum Sm.(1813) /Esmer bezelye
C7 Şanlıurfa: Karaköprü, Kaşmer dağı, Aşıkköy, 700 m, step, 23.05.2002, Akan 1997. Akdeniz elementi.

PROSOPIS L. (1767) / Çediotu
Prosopis farcta (Banks & Sol.) J.F. Macbr. (1929) / Çedi otu
C7 Şanlıurfa: Birecik, Zeytinbahçe köyü, 450 m, tarla kenarı, 26.09.2004, MMB 1078, MMB 1129, 1432; Şanlıurfa-Adıyaman 80 km, Kuyulu köyü, 600 m, yol kenarı, 13.11.2002, Akan 4203; Şanlıurfa-Bozova 15 km, 450 m, yol kenarı, 21.08.2007, MNM 1333; Kaşmer Dağı, Uyuzpınar köyü, Akan 2030, Akan 2458, Akan 5184&Çetin; **C8** Şanlıurfa: Ceylanpınar; TİGEM, 470 m, tarla kenarı, 07.05.2008, MNM 1396. İran-Turan elementi.

SCORPIURUS L. (1753) / Koyundücüğü
Scorpiurus subvillosus L. var. ***subvillosus*** (1753) / Koyun dücüğü
C7 Şanlıurfa: Birecik, Arat Dağı kuzeybatı tepeleri, 760 m, step, 18.05.2003, Korkut 168, Korkut 495, 500, Korkut 532; Kaşmer Dağı, Uyuzpınar köyü, step, 700 m, 02.05.2002, Akan 3049 & 3051; Kalecik dağı, Kırkpınar köyü, 850 m, taşlık alanlar, 25.05.2003, Aydoğdu1468/b, 1329/b, Aydoğdu 1264, Aydoğdu 1416/b; Şanlıurfa-Bozova, Nergisli köyü civarı, 745 m, yol kenarı, 29.04.2007, MNM 1218. Akdeniz elementi.

TRIFOLIUM L. (1753) / Yonca
Trifolium arvense L. var. ***arvense*** (1753) / Tavşan ayağı
C7 Şanlıurfa: Birecik; Çiftlik, 700 m, tarla kenarı, 24.05.2003, Akan 4725.

T. boissieri Guss. (1845) / Hoş yonca
C7 Şanlıurfa: Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1200; Birecik, Divriği Köyü, 760 m, step, 02.05.2004, Korkut 512. Akdeniz elementi.

T. bullatum Boiss. & Hausskn. (1872) / Misket yoncası
C7 Şanlıurfa: Birecik, Arat Dağı, 800 m, taşlık alanlar, 09.05.2004, Korkut 535; Kaşmer Dağı, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4209. Akdeniz elementi.

T. campestre Schreb. subsp. ***campestre*** var. **campestre** (1804) / Üçgül
C6 Şanlıurfa: Birecik, Bentbahçesi yol ayrımı, 510 m, step, 01.05.2005, MMB 1402, MMB 633; Mezra çıkısı, 465 m, nehir kenarı, 09.05.2004, MMB 755; **C7** Şanlıurfa: Bozova yolu; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1092, MNM 1227; Bozova-Adıyaman arası; Fırat nehri kenarı, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1123; Şanlıurfa-Hilvan karayolu 32 km, 700 m, yol kenarı, 06.05.2007, MNM 1251; Kalecik dağı, Kırkpınar köyü doğusu, 850 m, taşlık alanlar, 25.05.2003 Aydoğdu 1108, 1134, 1457; Şanlıurfa-Viranşehir karayolu 43 km, 560 m, kayalık alanlar, 07.05.2008, MNM 1405, MNM 1030, 1036; Kaşmer Dağı, Uyuzpınar köyü, 600 m, step, 02.05.2002, Akan 3060, Akan 1843.

T. carmeli Boiss. (1856) /Sivri yonca
C7 Şanlıurfa: Kalecik Dağı: kalecik mezrası, 900 m, taşlık alanlar, 23.05.2002, Aydoğdu 1165. Akdeniz elementi.

T. cherleri L. (1753) / Tokalıdücük
C7 Şanlıurfa: Şanlıurfa-Hilvan 32 km, 700 m, yol kenarı, 06.05.2007, MNM 1249; Şanlıurfa-Bozova 35 km, Cıbır köyü yol ayrımı, 735 m, step, 29.04.2007, MNM 1229. Akdeniz elementi.

T. dasyurum C. Presl (1830) / Duvaklı üçgül
C7 Şanlıurfa: Şanlıurfa-Viranşehir 45 km, 665 m, kayalık, 13.05.2007, MNM 1260; MNM 1281, MNM 1407; Viranşehir, 520 m, yol kenarı, 23.03.2002, Akan 2888; Bozova yolu, Kalecik Dağı, Kırkpınar köyü doğusu, 750 m, 25.05.2003, Aydoğdu 1451. Akdeniz elementi.

T. echinatum M. Bieb. (1808) / Kirpi üçgülü
C7 şanlıurfa: Bozova yolu, Kalecik dağı, Kalecik köyü, 900 m, step, 23.05.2002, Aydoğdu 1165; Kaşmer Dağı, Aşıkköy, 700 m, step, 23.05.2001, Akan 1948, Akan 2062. Akdeniz elementi.

T. globosum L. (1753) /Yumakyonca
C7 Şanlıurfa: Siverek-Hilvan 5 km, 700 m, yol kenarı, 06.05.2007, MNM 1240. Akdeniz elementi.

T. grandiflorum Schreb. (1767) / Hanım üçgülü
C7 Şanlıurfa: Karaköprü, Uyuzpınar köyü, 850 m, step, 22.05.2002, Akan 3962. Akdeniz elementi.

T. hirtum All. (1789) /Deli yonca
C6 Şanlıurfa: Birecik; Arat Dağı, 830 m, fıstıklık bağ içi, 04.05.2008, MNM1370; **C7** Şanlıurfa: Şanlıurfa-Viranşehir 43 km, 560 m, kayalık alanlar, 07.05.2008, MNM 1404, MNM 1440; Kaşmer Dağı, Uyuzpınar köyü, 800 m, step, 22.05.2002, Akan 3955. Akdeniz elementi.

T. infamia-ponertii Greuter (1976) /Ara yonca
C5 Adana: Merkez Otoban yolu, 1500 m, yol kenarı, 24.05.1997, Akan 1213; **C7** Şanlıurfa: Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1191; Birecik, Arat Köyü güneydoğusu, 800 m, tarla kenarı, 17.04.2004, Korkut 431. Akdeniz elementi.

T. leucanthum M. Bieb. (1808) / Yapışık üçgül
C6 Hatay: İskenderun, Belen, 400 m, yol kenarı, 15.04.2002, Akan 2788; Şanlıurfa: Birecik, Bentbahçesi 1 km, 01.05.2005, 510 m, step, MMB 1391; Birecik, Divriği köyü, 760 m, tarla kenarı, 01.06.2004, Korkut 556; **C7** Şanlıurfa: Kaşmer Dağı, Öğütçü köyü, 600 m, step, 02.05. 2002, Akan 3055, Akan 1999; Bozova yolu, Kalecik Dağı; Kalecik mezrası, 500 m, taşlık alanlar, 23.05.2002, Aydoğdu 1114; Şanlıurfa-Viranşehir 45 km, 665 m, kayalık, 13.05.2007, MNM 1265. Akdeniz elementi.

T. lucanicum Gasp. (1832) /Yumurta yoncası
C7 Şanlıurfa: Şanlıurfa-Bozova yolu: Kesmetaş köyü, 13.05.2006, 720 m, tarla kenarı, MNM 1136; Kaşmer Dağı, Aşıkköy, 700 m, step, 14.05.2001, Akan 1805, Akan 4212; Şanlıurfa-Hilvan 10 km, Karaköprü mevkii, 550 m, yol kenarı, 23.04.2007, MNM 1204 & Akan; Şanlıurfa-Viranşehir 45 km, 665 m, step, 13.05.2007, MNM 1265, 1274 & Balos. Akdeniz elementi.

T. nigrescens Viv. subsp. ***petrisavii*** (Clementi) Holmboe. (1914) / Yel üçgülü
C7 Şanlıurfa: Bozova yolu; Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1129; Birecik, Zeytinbahçe, höyük çevresi, 465 m, step, 09.05.2004, MMB 730/b, MMB 1536.

T. pauciflorum D'Urv. (1822) / Sülün üçgülü
C7 Şanlıurfa: Şanlıurfa-Viranşehir 45 km, 665 m, step, 13.05.2007, MNM 1262, 1264; Haliliye, Osmanbey kampüsü, 500 m, step, 22.04.2006, MNM 1031; Bozova yolu; Tektaş köyü yol ayrımı, 13.05.2006, 720 m, tarla kenarı, MNM 1076; Şanlıurfa-Hilvan karayolu 10 km, 23.04.2007, 550 m, yol kenarı, MNM 1197, Gölpınar Atatürk ormanı, 740 m, 14.iv.2010, Ayaz 1026; Kaşmer Dağı, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4210. Akdeniz elementi.

T. pilulare Boiss. (1843) / Boncuk üçgül
C7 Şanlıurfa: Bozova; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1077; Kalecik Dağı: Kırkpınar köyü doğusu, 600 m, taşlık alanlar, 04.05.2003, Aydoğdu 1302/a; Hilvan'ın 32 km güneyi, 06.05.2007, 700 m, yol kenarı, MNM 1245; Şanlıurfa-Viranşehir 45 km, 13.05.2007, 665 m, step, MNM 1261, MNM 1406; Birecik, Arat Köyü güneydoğusu, 780 m, tarla kenarı,17.04.2004, Korkut 448, Korkut 448; Kaşmer dağı, Dolamaç tepe, 600 m, step, 22.05.2001, Akan 4213. Akdeniz elementi.

T. purpureum Loisel. var. ***purpureum*** (1807) / Mor üçgül (Ekler, Şekil 33)
C6 Hatay: Hatay-Belen 27 km, 14.04.2002, 250 m, Akan 2767; **C7** Şanlıurfa: Şanlıurfa-Hilvan 6 km, 675 m, yol kenarı, 20.05.2007, MNM 1293, MNM 1433. Akdeniz elementi.

T. repens L. var. ***repens*** (1753) /Ak üçgül
C7 Aydın: Dilek Yarımadası milli parkı, 800 m, karışık ormanlık, 26.05.2002, Akan 3396.

T. resupinatum L. var. ***resupinatum*** (1753) / Anadolu üçgülü
C7 Şanlıurfa: Hilvan-Siverek karayolu 15 km, Buğur köyü civarı, 580 m, kayalık yamaçlar, 26.05.2007, MNM 1308; Kaşmer Dağı, Maşuk bölgesi, 600 m, yol kenarı, 14.05.2001, Akan 1832, 1799; Birecik, Mezra çıkısı, 465 m, nehir kenarı, 09.05.2004, MMB 756/a; Kalecik mezrası, 900 m, taşlık alanlar, 23.05.2002 Aydoğdu 1107.

T. scabrum L. (1753) / Hıyardücük
C7 Şanlıurfa: Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1202; Karaköprü, Gölpınar mesire ormanı, 720 m, 14.iv.2010, Ayaz 1005. Akdeniz elementi.

T. spadiceum L. (1755) / Çayır dutu
C7 Şanlıurfa: Bozova yolu, Kızlar köyü civarı, 720 m, tarla kenarı, 13.05.2006, MNM 1101; Şanlıurfa-Hilvan 32 km, 700 m, yol kenarı, 06.05.2007, MNM 1250, MNM 1297. Avrupa-Sibirya elementi.

T. spumosum L. (1753) / Kese yonca (Ekler, Şekil 32)
C7 Şanlıurfa: Şanlıurfa-Hilvan karayolu 32 km, 700 m, yol kenarı, 06.05.2007, MNM 1246, MNM 1193; Bozova yolu; Kızlar köyü civarı, 720 m, tarla kenarı, 13.05.2006, MNM 1099; Bozova yolu, Kalecik dağı, Korukzen köyü, 700 m, taşlık, 19.05.2003, Aydoğdu 1382, 1302/b, Aşıkköy, 700 m, step, 23.05.2002, Akan 1968. Akdeniz elementi.

T. stellatum L. var. ***stellatum*** (1753) / Yıldız yonca
C6 Şanlıurfa: Birecik, Divriği; Köyü yolu kenarı, 760 m, step, 01.06.2004, Korkut 563, Korkut 181; Birecik, Zeytinbahçe höyük çevresi, 465 m, step, 09.05.2004, MMB 730/a; Karaköprü, Kaşmer Dağı, Uyuzpınar köyü civarı, 700 m, step, 02.05.2002, Akan 2996&3010; Şanlıurfa-Hilvan 32 km, 650 m, yol kenarı, 12.04.2002, Akan 2702, MNM 1189; Bozova yolu, Tektaş köyü, 720 m, 13.05.2006, MNM 1062, 1084&Akan; Viranşehir yolu, Osmanbey kampüsü kuzey yamaçlar, 550 m, 27.03.2007, MNM 1151, MNM 1035, MNM 1257; Karaköprü, Gölpınar Atatürk ormanı, 750 m, 14.iv.2010, Ayaz 1065. Şanlıurfa-Suruç 3 km, 08.04.2007, 700 m, step, MNM 1162.

T. tomentosum L. var. ***tomentosum*** (1753) / Yünlü yonca
C7 Birecik, Zeytinbahçe höyüğü güneyi, 465 m, Mezra çıkısı, yol kenarı, 24.04.2004, MMB 479, 756/b; Birecik, Divriği köyü, , 760 m, yolu kenarı, 01.06.2004, Korkut 559; Haliliye, Osmanbey kampüsü, 500 m, step, 22.04.2006, MNM 1023, MNM 1263, 1276; Bozova yolu: Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1113; Kaşmer dağı, Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3042; Bozova-Adıyaman: Fırat nehri kenarı, 720 m, taşlık yamaçlar, 13.05.2006, MNM 1122; Hilvan'ın 10 km güneyi, 550 m, yol kenarı, 23.04.2007, MNM 1206, MNM 1247, 1248; Kalecik Dağı; Kırkpınar köyü, 650 m, taşlık alanlar, 04.05.2003, Aydoğdu 1344., Karaköprü, Gölpınar ormanı, 780 m, 12.iv.2011, Ayaz 1001; Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1159 & Akan. Akdeniz elementi.

TRIGONELLA L. (1753) / Çemenotu
Trigonella capitata Boiss (1843) / Top çemenotu
C2 Denizli: Pamukkale, 270 m, çayırlıklar, 29.5.2002, Akan 3461; Denizli-Pamukkale, 1550 m, bozuk orman açıklığı, 22.06.2003, Akan 4767. İran-Turan elementi.

T. cariensis Boiss. (1843) / Kokulu boncuk
C1 Aydın: Aydın-yarımadası milli parkı, Aydınlık köyü, 70 m, makilikler, 26.05.2002, Akan 3400; **C3** Antalya: Antalya-Bucak 20 km, 250 m, yol kenarı, 23.5.2002, Akan 3318, 3332. Akdeniz elementi.
T. cassia Boiss. (1849) / Halbet (Ekler, Şekil 35)
C5 Mersin: Mersin-Çopurlu; 160 m, meşe açıklıkları, 20.04.2002, Akan 2848, 2850; **C6** Hatay: Hatay-Yayla Dağı, 1025 m, çayırlık alanlar, 17.05.2003, Akan 4535; Hatay-Akçadağ Çandır Köyü-Teknecik 1 km, 1100 m, taşlık yamaçlar, 9.05.02, Akan 3248. **Endemik.** Akdeniz elementi.

T. caelesyriaca Boiss. (1849) / Handekok
C6 Gaziantep: Gaziantep-Nizip 6 km, 750 m, yol kenarı, 21.04.2002, Akan 2882, 2631, 2592; Gaziantep-Yavuzeli yolu; Dülük Köyü civarı, 860 m, çayırlık, 21.04.2002, Akan 2877; Birecik, Zeytinbahçe doğusu, 27.03.2004, 400 m, yol kenarı, MMB 148, 364, 1256; Birecik, Birecik, Arat Dağı kuzeybatı tepeleri; radyo istasyonu batısı, 810 m, step, 03.04.2004, Korkut 405; **C7** Şanlıurfa-Suruç, 470 m, yol kenarı, 04.06.2002, Akan 2554, 2564, MNM 1171; Şanlıurfa-Hilvan 7 km, 600 m, yol kenarı, 20.05.2003, Akan 2688, 2895, 4585, MNM 1184, 1301; Bozova yolu Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1108, 1420; Bozova yolu, Kalecik Dağı: Korukezen köyü, 780 m, taşlık alanlar, 24.04.2003, Aydoğdu 1081, 1247, 1353; Karaköprü, Gölpınar köyü civarı, 730 m, 14.iv.2010, Ayaz 1022; Kaşmer Dağı, Aşıkköy, 700 m, 14.05.2002, step, Akan 1765; Şanlıurfa-Viranşehir 5 km, 500 m, boş alanlar, 16.05.2006, MNM 1007, MNM 1014, 1154, 1340, Akan 4011, Akan 2884, 3975. İran Turan elementi.

T. cephalotes Boiss. & Balansa (1856) / Oyaotu
C2 Muğla: Marmaris, İnişdibi köyü üstleri, 300 m, orman açıklığı, 17.4.2002, Akan 2830. Akdeniz elementi.

T. cilicica Hub.-Mor. (1965) / Toros boyotu
C5 Mersin: Mersin-Gülek Boğazı 26 km, 830 m, orman içi, 1.6.2002, Akan 3605/a, 3605/b; Adana-Pozantı-Çiftehan 8 km, 850 m, taşlık yamaçlar, 08.06.2003, Akan 4682. **Endemik**. Akdeniz elementi.

T. coerulescens (M. Bieb.) Halácsy. subsp. ***coerulescens*** (1900) / Hintkokası
C7 Şanlıurfa: Bozova-Adıyaman; Karababa köprüsü, Fırat nehri kenarı, 720 m, taşlık yamaçlar,13.05.2006, MNM 1132. İran-Turan elementi.

T. corniculata (L.) L. (1759) / Gazal çemenotu
B1 İzmir: Bornova, Ege Üniversitesi; Botanik bahçesi, 50 m, çayırlık, 26.05.2003, Akan 4624, 3421, 3422; Bayraklı'nın üst kesimleri, 100 m, step, 26.05.2002, Akan 3410, 3408, 4616/a; Şaraphane, 30 m, çayırlık alan, 26.05.2003, Akan 4625; **C2** Denizli: Honaz Dağı Milli Parkı, 975 m, step, 29.5.2002, Akan 3459; Bodrum Kalesi, 18.4.2002, 10 m, kale içi, Akan 2827. Akdeniz elementi.

T. cretica (L.) Boiss. (1872) / Adanefeli (Ekler, Şekil 34).
B1 Manisa: Salihli, Kula, Sandal köyü, 770 m, 25.05.2003, Akan 4626; **C2** Burdur: Gölhisar-Dirmil 4 km, 950 m, korunmuş alan, 05.05.2003, Akan 3480. Akdeniz elementi.

T. filipes Boiss. (1849) /İnce boyotu (Ekler, Şekil 36)
C6 Gaziantep: Gaziantep-Yavuzeli; Dülük köyü, 480 m, çayırlık, 21.04.2002, Akan 2876, 2876a; Gaziantep-Şanlıurfa 8 km, 700 m, yol kenarı, 08.06.2003, Akan 4706; Kilis-Gaziantep, 750 m, yol kenarı, 07.04.2002, Akan 2606; Nizip-Birecik 11 km, 350 m, yol kenarı, 07.04. 2002, Akan 2632; Hatay: Hatay-Yayladağ, Şenköy, 430 m, makilikler, 14.04.2002, Akan 2750, 2759, Akan 4531; Şanlıurfa: Birecik-Halfeti arası Teketaş köyü, 480 m, çayırlık, 05.05.2002, Akan 3115, Akan 2721, 3103; Birecik, Divriği Köyü, 760 m, yolu kenarı, 02.05.2004, Korkut 508; **C7** Şanlıurfa-Suruç 6 km, 660 m, çayırlık, 05.05.2002, Akan 2572, 2577, 3200 3069, 3077, MNM 1156; Şanlıurfa: Akabe, 600 m, step, 06.04.2002, Akan 2547; Şanlıurfa: Karakuş köyü, 580 m, tarla kenarı, 22.04.2003, Akan 4499, 4507, Akan 4580; Şanlıurfa-Hilvan 45 km, 12.04.2002, 600 m, yol kenarı, Akan 2691, 2689 2699, 2713, 2713/a, MNM 1203; Bozova'nın güneybatısı, Fırat nehri kenarı, 590 m, step, 29.04.2007, MNM 1220; Kalecik Dağı; Kırkpınar köyü doğusu, 600 m, taşlık alanlar, 04.05.2003, Aydoğdu 1351; Şanlıurfa-Bozova; Tektaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1107, 1075, 1140; Şanlıurfa-Viranşehir karayolu 43 km, 07.05.2008, 560 m, kayalık alanlar, MNM 1002, 1402; Karaköprü, Gölpınar ormanı, orman orta kısımları, 770 m, 12.v.2011, Ayaz 1019; Kaşmer dağı, Uyuzpınar köyü, 800 m, step, 02.05.2002, Akan 2994. İran-Turan elementi.

T. foenum-graecum L. (1753) / Çemen otu
C6 Adana: Adana-Ceyhan 13 km, 120 m, tarla kenarı, 20.05.2002, Akan 3274, 3275,3275/a; Adana: Pozantı, 200 m, yol kenarı, 21.05.2002, Akan 3303; Adana-Ceyhan 7 km, 10-20 m, çayırlık, 21.04.2002, Akan 2860; Gaziantep: Dülükbaba ormanı, 1000 m, orman açıklığı, 18.05.02, Akan 3227; **C7** Şanlıurfa-Viranşehir; Osmanbey kampüsü, 545 m, step, 01.05.2008, MNM 1360 & Akan. İran-Turan elementi.

T. gladiata Steven ex M. Bieb. (1808) / Hülbe
B1 İzmir: Ege üniversitesi Rasathanesi, 615 m, korunmuş alan, 27.05.02, Akan 3416; İzmir: Bayraklı üstü, 400 m, makilik, 25.05.2003, Akan 4622; **C2** Muğla: Muğla-Marmaris; Datça yolu Emecik köyü, 20-30 m, makilikler, 27.05.2003, Akan 4628; **C4** Karaman: Akarköy Çukurbağ mevki, 1150 m, tarla kenarı, 30.05.2003, Akan 4670. Akdeniz elementi.

T. kotschyi Fenzl ex Boiss. (1849) /Ak boyotu
B1 İzmir: Efes-Yediuğurlar 10 km, 50 m, makilik, 26.05.2002, Akan 3413; **B5** Aksaray: Hasan Dağı, 900 m,

yol kenarı, 21.06.2003, Akan 4749; **C3** Antalya: Antalya-Elmalı 35 km, Arif köyü, 650-670 m, dere kenarı, 24.5.2003, Akan 3349; **C5** Mersin: Güzelyayla-Değirmendere 5 km, 790 m, çayırlıklar, 18.05.2003, Akan 4541,4546; Mersin: Tarsus-Namrun 30 km, 870 m, tarla kenarı, 21.05.2002, Akan 3292; Mersin: Tarsus, Egemen (Çay boyu), 50 m, kumlu tepeler, 24.4.2002, Akan 2855; Adana: Adana-Pozantı-Gülek Boğazı 25 km, 830 m, çayırlık alanlar, 01.06.2002, Akan 3600, 4703, 4681; Pozantı-Çiftehan 8 km, 852 m, taşlık yamaçlar, 08.06.2003, Akan 4688; Niğde: Ulukışla-Pozantı, 5 km, 1300 m, çayırlıklar, 1.6.2002, Akan 3593; **C6** Hatay: İskenderun-Arsuz yol ayrımı, 5-10 m, çayırlık, 15.04.2002, Akan 2779; Hatay: İskenderun-Belen 48 km, 10 m, çayırlık, 15.4.2002, Akan 2785, 2779; Osmaniye: Bahçe 23 km, 480 m, çayırlık, 21.04.2002, Akan 2873; Adana: Kozan-Feke 38 km, 750-800 m, orman açıklığı, 20.5.2002, Akan 3254; Adana-Ceyhan; Yakapınar, 10-20 m, çayırlık, 21.04.2002, Akan 2857; **C7** Şanlıurfa: Şanlıurfa-Hilvan 32 km, 650 m, yol kenarı, 12.4.2002, Akan 2693; **Endemik.** İran- Turan elementi.

T. lycica Hub.-Mor. (1965) /Yiğitboyotu
C3 Antalya: Elmalı, Çığlıkara, Finike-Elmalı arası, 650 m, taşlık alanlar, 28.05.2003, Akan 4637. **Endemik**. Akdeniz elementi.

T. macrorrhyncha Boiss. (1843)/ Boyotu
C5 Mersin: Mersin-Çopurlu, 160 m, meşe açıklıkları, 20.04.2002,Akan 2848; Mersin-Tarsus Çamlıyayla yolu 30 km, 850 m, makilikler, 18.05.2003. Akan 4554. **Endemik.** Akdeniz elementi.

T. monspeliaca L. (1753) / Som çemenotu
C3 Burdur: Burdur-Salda gölü, Sultan Pınar Tesisi civarı, 975 m, göl kenarı, 29.5.2002, Akan 3468; **C6** Şanlıurfa: Birecik, Akarçay köyü kuzey doğusu, 450 m, step, 04.04.2004, MMB 260; Birecik, Ziyaret tepesi, yol kenarı, 640 m, step, 09.05.2004, MMB 817; **C7** Şanlıurfa: Haliliye; Osmanbey kampüsü, 520 m, step, 22.04.2006, MNM 1015; Şanlıurfa: Bozova, Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1074, 1225; Bozova yolu, Kalecik Dağı; Kırkpınar köyü doğusu, 650 m, tarla kenarı, 04.05.2003, Aydoğdu 1352, MMB 821; Şanlıurfa-Suruç 3 km, 700 m, step, 08.04.2007, MNM 1164. Akdeniz elementi.

T. procumbens (Besser) Rchb. (1826) / Yatık boyotu
C4 Konya: Akşehir-Gelendost 5 km, 1110 m, 22.06.2003, Akan 4760, 4650.

T. pseudocapitata Contandr. & Quézel. (1976) / Kavruk boyotu
C2 Denizli: Denizli-Kelekçi Olukbaşı köyü, Geyran yaylası, 1550 m, orman açıklığı, 22.06.2003, Akan 4766. **Endemik**. Akdeniz elementi.

T. spicata Sm. (1813) /Başak boyotu
A5 Samsun: Merkez, 550 m, gölkenarı, 12.06.2003, Akan 4715, 4712; **B1** İzmir: Korudağı, Eğe Ünvirsitesi. Rasathanesi 615 m, 27.05.2002, Akan 3415, Akan 4617/b; **B2** Uşak: Uşak-Sivaslı, Kayagöl köyü 4 km, 900 m, çayırlık, 24.05.2003, Akan 4613; **B7** Adıyaman: Kuyulu, 575 m, erozyon alanı, 30.04.2002, Akan 2932; **C1** Aydın: Dilek Yarımadası Milli Parkı, 70 m, makilik, 26.5.2002, Akan 3399; **C2** Muğla: Muğla-Kale 7 km, 910 m, taşlık yamaç, 28.5.2002, Akan 3380, 3443, 3448, 480 m, 3380/a; Burdur-Dirmil 1. km, 1150 m, Bozuk orman açıklığı, 28.05.2003, Akan 4647; **C3** Antalya: Ayrancılar-Tahtalıköyü yolu 6 kım, 100 m, makilik, 25.05.2003, Akan 4617; Antalya: Antalya-Göktepe-Yılanlı dağı 7 km 1000 m, çayırlık, 25.05.2003, Akan 3375; Antalya: Elmalı-Gömbe Çobanlar mahallesi, 1300-1350 m, yamaçlar, 28.05.2003, Akan 4631; Antalya: Su Kemeri, 20 m, taşlık alanlar, 23.05.2002, Akan 3344; Antalya: Kaş-Kalkan, 20 m, makilik, 24.5.2002, Akan 3356, 2835; Antalya-Bucak 33 km, Yeşil Bayır girişi, 350 m, tarla kenarı, 16.04.2002, Akan 2806/b; Denizli: Denizli-Geyra-Babadağ 12 km, orman açıklıkları, 1200 m, 28.05.2002, Akan 3423; **C5** Adana: Kurttepe Teknik Lisesi civarı, 160 m, yol kenarı, 20.05.2002, Akan 3277; Adana: Pozantı-Gülek Boğazı 26 km, 820 m, Çayırlık, 08.06.2003, Akan 4702, 4679; Adana-Ceyhan 12 km, 20.05.2002, 120m, tarla kenarı, Akan 3273, Akan 3276, 3266; Mersin: Mersin-Güzelyayla-Değirmendere 4-5 km, 810 m, orman açıklığı, 18.05.2003, Akan 4542; **C6** Hatay: Belen otoban altı, 300 m, çayırlık, 17.05.2003, Akan 4522; Yayladağ Akra (Kel Dağı), 1025 m, çayırlık, 17.05.2003, Akan 4537, 4534; Hatay-Çandır 7 km, taşlık alanlar, 850-900 m, 19.05.2002, Akan 3247; İskenderun: Arsuz yol ayrımı hava alanı civarı, 5-10 m, çayırlık, 15.04.2002, Akan 2778/a; İskenderun: Belen, yol kenarı, 100 m, 15.04.2002, Akan 2783; **C7** Şanlıurfa: Şanlıurfa-Hilvan 32 km, 650 m, yol kenarı, 28.04.2002, Akan 2910; Birecik; Halfeti-Teketaş köyü yol ayrımı, 480 m, yol kenarı, 05.05.2002, Akan 3114, MNM 1079; Bozova güneybatısı, Fırat nehri kenarı, 590 m, step, 29.04.2007, MNM 1224; Şanlıurfa-Hilvan arası, 675 m, yol kenarı, 20.05.2007, MNM 1296. İran-Turan elementi.

T. spruneriana Boiss (1843) / Koç boyotu
A4 Ankara: Polatlı-Sivrihisar 5 km, 800 m, çayırlık, 24.05.2003, Akan 4598; **A5** Samsun: Merkez, 550 m, step, 12.06.2003, Akan 4713; **A9** Kars: Kağızman, Sarıkoç çiftliği, 1600 m, çayırlıklar, 13.7.2002, Akan 3731, 3720; **B2** Uşak: Kayagöl köyü 4.km, 900 m, çayırlık, 24.05.2003, Akan 4608, 4615; Konya: Konya-Hadim 10 km, 1400 m, yol kenarı, 17.07.2002, Akan 3788; **B3** Afyon: Afyon-Boyat 5 km, 1200 m, çayırlık, 24.05.2003, Akan 4596; **B4** Ankara: Eskişehir yolu 5 km, 850-900 m, çayırlık, 24.05.2003, Akan 4590; **B5** Aksaray'ın 28 km güneyi, tarla kenarı, 1145 m, 19.05.2003, Akan 4571; **B6** Karaman-Ereğli 8 km, 980 m, step, 01.06.2002, Akan 3573; Akan 4671; Konya -Akşehir, Şaharen köyü civarı, 1160 m, yol kenarı, 22.06.2003, Akan 4753; **C2** Denizli: Geyra, Babadağ, yol kenarı, 1200-1300 m, 28.05.2002, Akan 3433, 3431, 3428, 3458; Muğla-Kale 1 km, 480 m, taşlık yamaçlar, 25.05.2002, Akan 3381; Burdur: Gölhisar-Dirmil 10 km, 1200 m, serpantin, 30.5.2002, Akan 3495, 3497; **C3** Antalya: Serik-Kum köyü 5 km, kumsal alanlar, 16.04.2002, Akan 2803; Antalya: Geyra; Kale, 950 m, çayırlık, 28.05.2002, Akan 3438; Antalya: Lara, 200 m, maki açıklığı, 17.04.2002, Akan 2810, 2811, 2798; Antalya-Bucak 50 km, Hafızpaşa 3 km, 880 m, makilik, 23.05.2002, Akan 3330, 2810, 3318, 3320, 2806/b, 3323; Antalya: Korkuteli, Karaman geçidi, yol kenarı, 1300 m, 30.05.2002, Akan 3525; Antalya: Antalya-Akşehir 101 km, 450 m, yol kenarı, 19.04.2002, Akan 2834; Elmalı-Gömbe, 1300-1350 m, 28.05.2003, Akan 4633, 4639, 3522; Isparta: Devres Dağı, kayak merkezinin üstü, 1050 m, 30.05.2002, Akan 2002; Isparta: Çiçek Dağı; Gedikli, 31.5.2002, 1350 m, Akan 3559; Burdur: Salda gölü, 1150 m, 29.05.2002, Akan 3463, 3467; Burdur: Selda gölü Dirmil geçidi, 1450 m, serpantin, 30.5.2002, Akan 3513, 3541; **C4** Konya: Taşkent-Hadim 7 km, 17.07.2002, 1500 m, Akan 3800; Ereğli-Karapınar 25 km, yol kenarı, 1600-1650 m, 01.06.2002, Akan 3589; **C5** Adana: Ceyhan çıkışı, yol kenarı, 70 m, 20.05.2002, Akan 3270; **C6** Hatay: Akra Dağı, Teknecik karakolu civarı, 1185 m, meşelikler, 19.5.2002, Akan 3233; Adıyaman: Kuyulu köyü, 575 m, yol kenarı, 30.04.2002, Akan 2933; Şanlıurfa-Birecik 28 km, 650 m, yol kenarı, 05.05.2002, Akan 3092, 3210, 3092; Suruç, Payamlı, 600-750 m, step, 20.05.2003, Akan 3081, 4577, 4578, 3081, 3198, MNM 1177; Gaziantep: Nizıp-Fırat nehri 5 km, 380 m, taşlık yamaçlar, 13.04.2002, Akan 2731, 3215, 4709; **C7** Şanlıurfa: Halfeti, Teketaş Köyü, 480 m, çayırlık, 05.05.2002, Akan3113/b; Şanlıurfa-Viranşehir 20 km, 500-600 m, step, 29.04.2001, Akan 1645, 1645/b, 4503; Şanlıurfa-Hilvan 8 km, 600-750 m, step, 20.05.2003, Akan 4584; Birecik, Zeytinbahçe höyük güneyi, 440 m, yol kenarı, 24.04.2004, MMB 512, 495, 719, 822; Şanlıurfa'nın 5 km doğusu, 500-550 m, 16.04.2006, MNM 1008, 1137, 1222; Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1178, 1300; Kalecik Dağı; Kalecik mezrası çeviresi, 900 m, taşlık alanlar, 23.05.2002, Aydoğdu 1139/b, 1468/a; 1414, 1416/a, 1073; Gölpınar köyü civarı, step, 730 m, 11.4.2011, Ayaz 1258; Kaşmer dağı, Aşıkköy, 700-800 m, step, 14.05.2002, Akan 1840. İran-Turan elementi.

T. strangulata Boiss. (1849) / Düğmeli boyotu
C2 Muğla: Kale 1 km, 1000 m, taşlık yamaçlar, 25.05.2002, Akan 3380-3380/b; **C3** Isparta: Süleyman Demirel Botanik bahçesi, 1050 m, 29.05.2003, Akan 4648; Antalya-Konya arası, 10 m, kayalıklar, 17.04.02, Akan 2826; **C5** Mersin: Tarsus-Egemen, 870 m, 21.05.2002, Akan 3289; Mersin: Tarsus-Çamlıyayla yolu 30 km, 850 m, makilik, 18.05.2003, Akan 4551; Adana: Pozantı-Gülek Boğazı 26 km, 830 m, çayırlık, 01.06.2002, Akan 3605/a; Adana: Pozantı-Çiftehan 8.km, 852 m, taşlık yamaçlar, 08.06.2003, Akan 4684; **C6** Hatay: Akradağ; Teknecik karakoyolu civarı, 19.5.2002, 1185 m, meşelikler, Akan 3234, Akan 3235; Yayla Dağı, 17.05.2003, 1025 m, çayırlık, Akan 4536. İran- Turan elementi.

T. velutina Boiss. (1843) / İpekboyotu
B4 Ankara: Polatlı-Afyon 107 km, 1000 m, tarla kenarı, 24.05.2003, Akan 4601,4607; **C2** Burdur: Gölhisar-Dirmil 4 km, 950 m, ağaçlandırma sahası, 30.5.2002, Akan 3487, 3492; Tefenni-Çavdır 9-10 km, 1150 m, göl kenarı, 29.5.2002, Akan 3473; Gölhisar-Dirmil 4 km, 950 m, ağaçlandırma sahası, 30.5.2002, Akan 3487, 3492; Denizli: Honaz Dağı-Milli Parkı 3 km, 1050 m, kayalıklar, 28.5.2002, Akan 3456, 3459/b; **C3** Isparta: Şarkikaraağac'ın 5 km güneyi, 1050 m, çayırlıklar, 31.5.2002, Akan 3551; **C4** Karaman: Gelendost-Akşehir, 1275 m, step, 29.05.2003, Akan 4652; Konya'nın 20 km batısı, 1470 m, plantasyon alanı, 29.05.2003, Akan 4660; Konya-Hadim, 1350 m, yol kenarı, 17.7.2002, Akan 3790, Akan 4654; **C5** Niğde: Ulukışla-Pozantı 5 km, 1300 m, 01.06.2002, Akan 3591. İran-Turan elementi.

VICIA L. (1753) / Fiğ
Vicia aintabensis Boiss. & Hausskn. ex Boiss. (1872) / Antep fiği
C7 Şanlıurfa: Birecik, Arat Köyü güneydoğusu, 780 m, step, 17.04.2004, Korkut 435, 465; Şanlıurfa-Viranşehir 40 km, 560 m,step, 22.04.2008, MNM 1348; Bozova 15 km, 720 m, bağ kenarı, 10.05.2008, MNM 1424; Gölpınar Atatürk

ormanı, 740 m, 4.4.2012, Ayaz 1330, Aşıkköy, 700-800 m, step, 23.05.2002, Akan 1991/b. İran-Turan elementi.

V. anatolica Turrill (1927) / Yılan fiği
C7 Şanlıurfa: Birecik, Zeytinbahçe höyük çevresi, 450 m, tarla kenarı, 24.04.2004, MMB 562, 580; 628, MMB 1382; Kaşmer Dağı, Uyuzpınar köyü, 700 m, step, 02.05.2002, Akan 3003, 3056; Kalecik Dağı; Korukezen köyü kuzeybatısı, taşlık alanlar, 750 m, 24.04.2003, Aydoğdu 1273/a, 1083, 1136/a, 1041. İran-Turan elementi.

V. assyriaca Boiss. (1849) /Sitri
C7 Şanlıurfa: Siverek, Karacadağ eteği, 1208 m, tarla kenarı, 18.05.2008, MNM 1445; Birecik, Arat Dağı; kuzeybatı tepeleri, 800 m, taşlık, 03.04.2004, Korkut 399; Kalecik Dağı; Kırkpınar Köyü, 600-650 m, taşlık alanlar, 04.05.2003, Aydoğdu 1341. İran-Turan elementi.

V. cracca L. subsp. ***cracca*** (1753) / Kuşfiği
C7 Şanlıurfa: Şanlıurfa-Hilvan 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1205. Avrupa-Sibirya elementi.

V. cracca L. subsp. ***stenophylla*** (Velen) C.D. Preston (1986) / Meşe fiği
C6 Şanlıurfa: Birecik; Arat Dağı, 830 m, bağ içi, 04.05.2008, MNM 1369; Bozova karayolu: Maşuk köyü, 550 m, step, 23.04.2006, MNM 1050; İbid., Kızlar köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1126; Bozova: Nergisli köyü civarı, 745 m, yol kenarı, 29.04.2007, MNM 1212; Şanlıurfa-Bozova karayolu 25 km, 700 m, step, 09.06.2007, MNM 1323. Avrupa-Sibirya elementi.

V. cuspidata Boiss. (1843) / Ege baklası
C7 Şanlıurfa: Kalecik Dağı; Korukezen köyü kuzeybatısı, beyaz topraklı alanlar, 750 m, 24.04.2003, Aydoğdu 1283. Akdeniz elementi.

V. ervilia (L.) Willd (1802) / Küşne
C7 Şanlıurfa: Şanlıurfa-Suruç 15 km, 630 m, orman içi, 08.04.2007, MNM 1172 / b & Akan; Şanlıurfa-Suruç arası 5 km, 630 m, tarla içi, 04.05.2008, MNM 1368; Birecik, Arat Dağı kuzeybatı tepeleri, 800 m, 09.05.2004, Korkut 530; Şanlıurfa-Hilvan karayolu 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1195; Şanlıurfa-Bozova karayolu 35 km, Cıbır köyü yol ayrımı, 735 m, step, 29.04.2007, MNM 1232,1356; Kalecik Dağı; Korukezen köyü kuzeybatısı, beyaz tapraklı, taşlık alanlar, 750-780m, 24.04.2003, Aydoğdu 1273/b, 1325 /b, Gölpınar Atatürk ormanı, 730 m, 04.4.2011, Ayaz 1016. Akdeniz elementi.

V. hirsuta (L.) Gray (1821) /Bozfiğ
C7 Şanlıurfa: Öğütçü köyü, 700-800 m, step, 02.05. 2002, Akan 3011. Akdeniz elementi.

V. hybrida L. (1753) /Melez bakla
C7 Şanlıurfa: Bağlarbaşı, tarla kaenarı, 600-700 m, 14.05.2001, Akan 1801; Birecik, Zeytinbahçe, 489 m, dere kenarı, 01.05.2005, MMB 1276; Bozova yolu; Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1065, 1086, 1094; Kalecik Dağı; Korukezen köyü civarı, 600-700 m, beyaz topraklı alanlar, 19.05.2003, Aydoğdu 1361. Akdeniz elementi.

V. lunata (Boiss. & Balansa) Boiss.var. **lunata** Boiss. / Ay baklası
C7 Şanlıurfa: Kırkpınar Köyü doğusu, 500-850 m, taşlık alanlar, 25.05.2003, Aydoğdu 1458; Kalecik Dağı; Korukezen köyü civarı, 600, kireçli topraklar, 19.05.2003, Aydoğdu 1408.

V. narbonensis L. var. ***narbonensis*** (1753) / Koca fiği
C7 Şanlıurfa: Birecik, Arat Köyü kuzey batı tepeleri, 800 m, taşlık alanlar, 13.04.2003, Korkut 54; Akarçay kuzey doğusu, 450 m, 04.04.2004, MMB 297; Mezra-Akarçay arası 3 km, 371 m, step, 11.04.2004, MMB 345, 407; Bentbahçesi-Bozdere 2 km, 490 m, step, 27.03.2005, MMB 1182, 1237; Bentbahçesi-Tılfar arası, 490 m, step, 27.03.2005, MMB 1245, Arat Köyü güneydoğusu, 800 m, tarla kenarı, 17.04.2004, Korkut 447; Bozova, Kesmetaş köyü, 720 m, tarla kenarı, 13.05.2006, MNM 1135; Şanlıurfa-Hilvan karayolu 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1181; Şanlıurfa-Hilvan karayolu 6 km, 675 m, yol kenarı, 20.05.2007, MNM 1295; İbid., Şanlıurfa-Siverek 5 km, 700 m, yol kenarı, 06.05.2007, MNM 12421; Şanlıurfa-Viranşehir karayolu 37 km, 581 m, step-kayalık, 13.05.2007, MNM 1266, 1273; İbid., 40 km, 560 m, step, 22.04.2008, MNM 1338, Orman güneybatı kısımları, step, 730 m, 20.5.2012, Ayaz 1013. Aşıkköy, 600-700 m, tarla, 14.05.2002, Akan 1795. Akdeniz elementi.
V. palaestina Boiss. (1849) / Yabani küşne
C7 Şanlıurfa: Kalecik Dağı; Korukezen köyü civarı, 650 m, beyaz topraklı alanlar, 19.05.2003, Aydoğdu 1375; Arat Dağı güneybatısı, vadi alanı, 750m, step, 18.05.2003, Korkut 160, Akdeniz elementi.
V. peregrina L. (1753) / Kavli
C7 Şanlıurfa: Birecik, Divriği Köyü yolu kenarı, 760 m, tarla kenarı, 02.05.2004, Korkut 509; Zeytinbahçe doğusu, 400 m, yol kenarı, fıstık bahçeleri, 27.03.2004, MMB 151, 197, 472; Bentbahçesi; Tılfar arası 3 km, 500 m, step, 27.03.2005, MMB 1239, 1243; Birecik, Mezra-Akarçay arası 3 km, 371 m, kayalıklar, 11.04.2004, MMB 345, 954,

1266; Divriği Köyü, yol kenarı, 760 m, 02.05.2004, Korkut 509; Haliliye; Mardin yolu, Osmanbey kampüsü, kuzey yamaçlar, 500-550 m, 27.03.2007, MNM 1147, Gölpınar Atatürk Ormanı, step, 770 m, 14.iv.2010, Ayaz 1052.

V. sativa L. subsp. ***amphicarpa*** (Dorth) Aschers. & Graebn. (1909) / Akfiğ
C7 Adıyaman: Kuyulu köyü, yol kenarı, 600-800 m, 02.05.2004, Akan 5132; Şanlıurfa-Viranşehir 40 km, 560 m, yol kenarı, 22.04.2008, MNM 1337.

V. sativa L. subsp**. *macrocarpa*** (Moris) Arc. (1882) / Elçi fiği
C7 Şanlıurfa: Kalecik Dağı, Kırkpınar köyü doğusu, 600 m, taşlık alanlar, 04.05.2003, Aydoğdu 1328, Aydoğdu, 1363; Bozova yolu, Tektaş köyü yol ayrımı, 720 m, tarla kenarı, 13.05.2006, MNM 1082, MNM 1128; Şanlıurfa-Bozova karayolu 35 km, Cıbır köyü yol ayrımı, 735 m, step, 29.04.2007, MNM 1234; Birecik, Arat Dağı güneybatısı, vadi alanı, 760 m, step, 18.05.2003, Korkut 192; Şanlıurfa-Viranşehir 45 km, 665 m, step, 13.05.2007, MNM 1259. Avrupa-Sibirya elementi.

V. sativa L. subsp. ***nigra*** Ehrh. (1780) / Eşek gürülü
C6 Şanlıurfa: Birecik: Bentbahçesi, 570 m, yol kenarı, 06.05.2007, MNM 1256, 564, 150, 1277, 1303; Şanlıurfa-Suruç karayolu 15 km, 08.04.2007, 630 m, orman içi, MNM 1169, 1170; Kalecik Dağı; Korukezen köyü kuzey batısı, taşlık alanlar, 750- 880 m, 24.04.2003, Aydoğdu 1269; Bozova yolu: Maşuk köyü, 23.04.2006, 550 m, step, MNM 1038, 1054, 1055, 1199, 1237, 1066, 1073, 1078, 1083, 1100, 1194, 1208; Şanlıurfa-Viranşehir 37 km, 581 m, kayalık, 13.05.2007, MNM 1268, 1148, 1271, 1278, Kalecik Dağı, Kırkpınar köyü, 650 m, 04.05.2003, Aydoğdu 1301, 1459/b, Aydoğdu 1083/b, 1084/b, 1269/b, Gölpınar Atatürk Ormanı, step, 750 m, 04.4.2011, Ayaz 1008.
V. sativa L. subsp. ***sativa*** (1753) / Fiğ
C7 Şanlıurfa: Şanlıurfa-Bozova yolu: Maşuk köyü, 550 m, step, 23.04.2006, MNM 1038, 1054, 1055, 1066, 1073, 1078, 1081; Şanlıurfa-Hilvan karayolu 10 km, 550 m, yol kenarı, 23.04.2007, MNM 1194, 1208; Şanlıurfa-Bozova 30 km, 700 m, yol kenarı, 29.04.2007, MNM 1237; Şanlıurfa-Viranşehir karayolu 37. km, 580 m, step, 13.05.2007, MNM 1268; C6 Şanlıurfa: Birecik: Bentbahçesi, 570 m, yol kenarı, 06.05.2007, MNM 1256 & Balos.

V. sericocarpa Fenzl. var. ***sericocarpa*** **(**1842) / Çit fiği
C7 Şanlıurfa: Şanlıurfa-Suruç 3 km, 700 m, yol kenarı, 08.04.2007, MNM 1168. İran-Turan elementi.

V. villosa Roth subsp. ***villosa*** (1793) / Tüylü fiğ
C7 Şanlıurfa: Arat Dağı, 850 m, tarla kenarı, 06.04.2003, Korkut 13; Şanlıurfa-Bozova 20 km, 720 m, bağ kenarı, 10.05.2008, MNM 1426.

V. villosa Roth subsp. ***eriocarpa*** (Hausskn.) P.W.Ball (1968) /Boğala
C7 Şanlıurfa: Gölpınar köyü civarı, step, 730 m, 14.iv.2010, Ayaz 1009.

Tartışma ve Sonuç

HARRAN herbaryumunda bulunan Fabaceae familyasına ait 975 bitki örneğinin incelenmesi sonucu 25 cinse ait 200 takson tespit edilmiştir.

Türkiye Bitkileri Listesi (Güner ve ark., 2012)'ne göre Fabaceae familyasının güncel takson sayısı 1228, endemik takson sayısı 383 iken, HARRAN herbaryumunda ise 200 takson ve 33 endemik takson ile temsil edilmeketdir. Bu durumda HARRAN herbaryumunda familyanın temsil edildiği oran %16.28, endemizm oranı ise %8.6'dır. Şekil 5'te Fabaceae familyasının HARRAN herbaryumundaki sayılarının Türkiye florası ile karşılaştırılması gösterilmiştir.

Ülkemizin farklı herbaryumlarında Fabaceae familyasının koleksiyonu üzerinde lisansüstü düzeyde tezler hazırlanmıştır. Bunlardan biri Çetinkaya (2007) tarafından hazırlanan "Dicle Üniversitesi Herbaryumundaki (DUF) Fabaceae ve Ranunculaceae Familyalarının Yeniden Düzenlenmesi" isimli yüksek lisans tez çalışmasıdır. Bu çalışmada Fabaceae familyasına ait 25 cinse bağlı 188 tür tespit edilmiştir. Bir diğer çalışma ise Mahamat (2014) tarafından yapılan tez çalışmasında ISTF herbaryumunda bulunan Fabaceae familyasına ait 50 cins ve bu cinslere ait toplam 393 tür tespit edilmiştir.

HARRAN, DUF ve ISTF herbaryumlarında bulunan Fabaceae familyasına ait taksonlar Şekil 6'de karşılaştırmalı olarak verilmiştir (Çetinkaya, 2007; Mahamat, 2014).

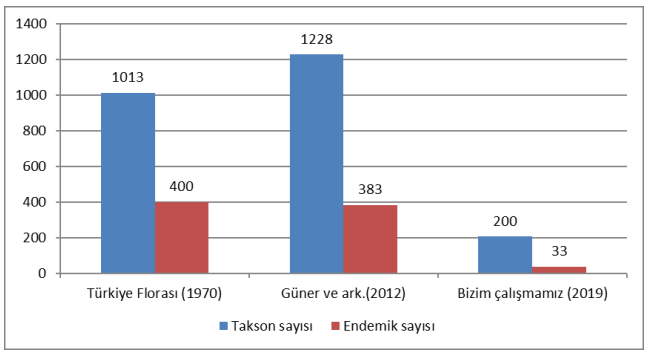
HARRAN herbaryumunda taksonların 33'i Türkiye için endemiktir. En fazla endemik takson içeren cins *Astragalus* (15) olup bunu *Medicago* (10) ve *Trigonella* (6) takip etmektedir (Tablo 1).

Tablo 1: HARRAN herbaryumunda en fazla endemik takson içeren cinsler

Cins adı	Endemik takson sayısı
Astragalus	15
Medicago	10
Trigonella	6
Cicer	1
Onobrychis	1

Tablo 2'de Fabaceae familyasına ait HARRAN herbaryumunda kayıtlı endemik taksonların isimleri ve tehlike kategorileri verilmiştir. Taksonların güncel tehlike kategorileri yakın yıllarda yapılan revizyon çalışmalarından yararlanılarak tespit edilmiştir (Akan, Ekici & Aytaç, 2005; Akan,ve Aytaç, 2014; Aytaç vd., 2016). HARRAN Herbaryum'unda familyanın endemizm oranı %8,6'dır.

HARRAN Herbaryumunda bulunan Fabaceae familyasının takson açısından zengin cinsleri *Astragalus* L. (48), *Medicago* L. (37), *Trifolium* L. (25), *Trigonella* L. (22), ve *Vicia* L. (20)'dır. Sırasıyla diğer cinslerin takson sayıları ise *Lathyrus* (11), *Onobrychis* (9), *Cicer* (4), *Ononis* (3), *Lotus* (2), *Pisum* (2), *Hedysarum* (2), *Lens* (2), *Melilotus* (2), *Alhagi* (1), *Anagyris* (1), *Argyrolobium (1), Coronilla* (1), *Galega* (1), *Genista* (1), *Glycyrrhiza* (1), *Anthyllis* (1), *Prosopis* (1) *ve Scorpiurus* (1)'dır. HARRAN herbaryumunda bulunan Fabaceae familyasına ait cinslerin takson sayıları Şekil 7'de verilmiştir. Fabaceae familyası Türkiye Florası'nda 72 cins ile temsil edilirken, HARRAN herbaryumunda 25 cins (%34,72) ile temsil edilmektedir.



Şekil 5. HARRAN herbaryumundaki taksonların Türkiye florasındaki takson sayısı ve endemizm açısından karşılaştırılması

Tablo 2: HARRAN herbaryumunda kayıtlı endemik taksonların isimleri ve tehlike kategorileri

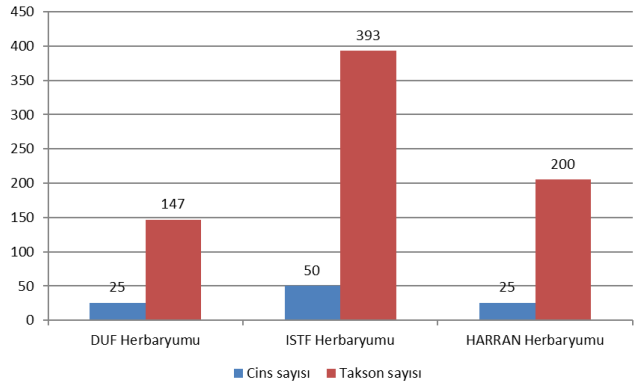
	Endemik Takson adı	Tehlike kategorisi
1	*Astragalus aytatchii*	EN
2	*Astragalus bahcesarayensis*	EN
3	*Astragalus crinitus*	NT
4	*Astragalus dipsaceus*	LC
5	*Astragalus ekicii*	CR
6	*Astragalus ekimii*	CR
7	*Astragalus elatus*	NT
8	*Astragalus gymnalopecias*	EN
9	*Astragalus lamarckii*	LC
10	*Astragalus mardinensis*	VU
11	*Astragalus nervulosus*	VU
12	*Astragalus ovabaghensis*	EN
13	*Astragalus panduratus*	EN
14	*Astragalus scabrifolius*	EN
15	*Astragalus uhlwormianus*	CR
16	*Cicer echinospermum*	VU
17	*Medicago arenicola*	CR
18	*Medicago carica*	NT
19	*Medicago halophila*	CR
20	*Medicago huberi*	LC
21	*Medicago isthmocarpa*	VU
22	*Medicago pamphylica*	VU
23	*Medicago rhytidiocarpa*	VU
24	*Medicago rigida*	LC
25	*Medicago rostrata*	NT
26	*Medicago shepardii*	VU
27	*Onobrychis podperae*	VU
28	*Trigonella cassia*	CR
29	*Trigonella cilicica*	EN
30	*Trigonella kotschyi*	LC
31	*Trigonella lycica*	NT
32	*Trigonella macrorrhyncha*	LC
33	*Trigonella pseudocapitata*	C R

Herbaryumda Fabaceae familyasına ait taksonların fitocoğrafik bölgelere göre dağılımı İran-Turan %47 (94 takson), (Akdeniz %32.5 (65 takson), Avrupa-Sibirya %2.5 (5 takson) ve fitocoğrafik bölgesi bilinmeyenler ise %18 (36 takson)'dir (Şekil 8). İran-Turan fitocoğrafik

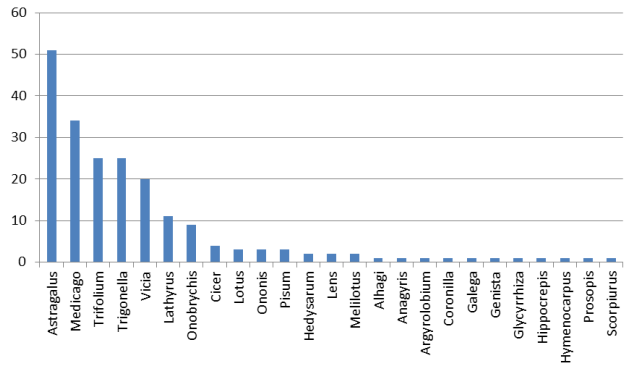
elementlerinin en yüksek oranda olması herbaryumdaki örneklerin genellikle Güneydoğu Anadolu bölgesinden toplanması ve bölgenin İran-Turan floristik bölgesinde olmasından kaynaklanmaktadır.

HARRAN herbaryumunda yaptığımız incelemelerde bazı bitkilerin yeniden değerlendirilmesi sonucu sinonime düştüğü tespit edilmiştir. HARRAN Herbaryumunda sinonime düşen bitki listesi Tablo 3'de verilmiştir.

Herbaryumumuzda mevcut 29 taksonun tip örnekleri ülkemizden bilinmektedir. Bunlar; *Astragalus alopecurus, Astragalus angustiflorus* subsp. *angustiflorus*, *Astragalus barba-jovis*, *Astragalus decurrens*, *Astragalus dipodurus*, *Astragalus gaziantepicus*, *Astragalus macrocephalus* subsp. *cucullaris*, *Astragalus macrocephalus* subsp. *macrocephalus*, *Astragalus ponticus*, *Astragalus xylobasis*, *Cicer pinnatifidum*, *Genista anatolica*, *Hedysarum pannosum*, *Hedysarum varium* subsp. *syriacum*, *Lathyrus aphaca* var. *biflorus*, *Lathyrus aphaca* var. *modestus*, *Lathyrus boissieri*, *Lathyrus cassius*, *Lathyrus chrysanthus*, *Lens culinaris* subsp. *orientalis*, *Medicago biflora*, *Medicago Phrygia*, *Onobrychis galegifolia*, *Onobrychis megataphros, Ononis spinosa* subsp. *leiosperma*, *Trifolium nigrescens* subsp. *petrisavii, Trifolium pauciflorum, Trifolium pilulare ve Trigonella cephalotes'dır.*
2000'li yıllardan sonra tarafımızdan bilim dünyasına

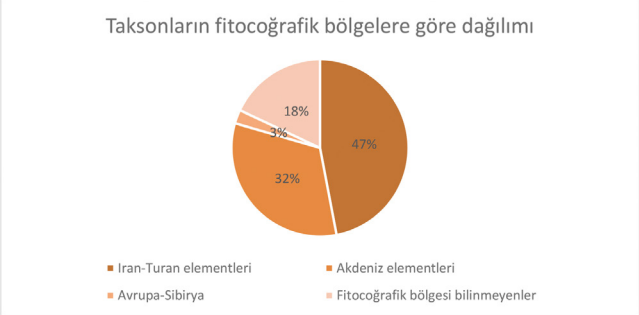


Şekil 6. HARRAN, DUF ve ISTF herbaryumlarındaki Fabaceae familyasına ait takson sayılarının karşılaştırılması



Şekil 7. HARRAN herbaryumunda bulunan Fabaceae familyasına ait cinslerin takson sayıları

kazandırılan familyaya ait özellikle endemik bazı *Astragalus* türlerinin tip örnekleri de herbaryumumuzda saklanmaktadır. Bunlar *Astragalus aytatchii* (Akan ve Civelek, 2001), *Astragalus bahcesarayensis* (Akan ve ark., 2008), *Astragalus ekicii* (Duman & Akan, 2003) ve *Astragalus ovabaghensis* (Akan & Aytaç, 2004)'dır.



Şekil 8. HARRAN herbaryumunda Fabaceae familyasına ait taksonların fitocoğrafik bölgelere göre dağılımı

Tablo 3. HARRAN Herbaryumunda Fabaceae taksonlarına ait sinonime düşen taksonlar ve geçerli isimleri

Bitkinin geçerli ismi	**Herbaryumda sinomime düşen bitki ismi**	**HARRAN Herbaryumundaki Toplayıcı no**
Alhagi maurorum subsp. maurorum	*A. pseudalhagi*	Korkut 660; MMB 1546; Aydoğdu 1516
Anthyllis circinnata	*Hymenocarpos circinnatus*	MNM 1166; MNM 1388; MMB 891, MMB 1368; MNM 1238; Akan 3050; MNM 1004;
Astragalus caprinus subsp. caprinus	*A. lanigerus*	Aydoğdu 1018 & Akan; Akan 1816, Akan 2092.
A. petropolitanus	*A.trichocalyx*	Akan 1294
A. alopecurus	*A. maximus var. dasysemius* *A. maximus*	Akan 1288/b & Ekici; Akan 1302 & Ekici; Akan 1366 & Ekici; Akan 1336 & Ekici; Akan 1361 & Ekici
A. oocephalus	*Astragalus oocephalus subsp. oocephalus,* *Astragalus oocephalus subsp. stachyophorus,* *Astragalus stojani Nábělek*	Akan 1417; Akan 1483, Akan 2313
A. aduncus	*Astragalus xylobasis var. angustus*	MNM 1334; MNM 1393; Korkut 100; Aydoğdu 1369, Akan
Hedysarum varium subsp. syriacum	*H. syriacum*	Korkut 619, MNM 1412 & Balos, Akan 2064.
Lotus gebelia var. gebelia	*L. gebelia var. hirsutissimus*	MNM 1399
Medicago arenicola	*Trigonella arenicola*	Akan 2801, 2821/b
M. astroites	*Trigonella astroites*	Akan 3314, 2808, 3586, 3116 583, 3586, 4750, 4561, 4567, 4708, 3116, 2906, 5265; MNM 1138, 863, 1064
M. biflora	*Trigonella lunata*	Akan 3499,4645,3516, 3457, 4687,3594,4693
M. brachycarpa	*Trigonella brachycarpa*	Akan 4586, 4592, 4586, 4754, 3445, 4641, 3552, 4544 3801,4674, 4552, 3601, 3602, 3604, 4742, 4686, 4700, 3601, 3602, 3604, 4521, 3807, 3780, 3294
M. carica	*Trigonella carica*	Akan 2829, 3366
M. crassipes	*Trigonella crassipes*	Akan 4611, 3436, 3434, 3512, 3464, 3386, 3452, 3389, 3325, 3464, 3325, 3542, 4644, 4635, 3578, 4573, 4692, 4565, 2875, 2868, 3201, 2623, 2617, 2621, 3444
M. fischeriana	*Trigonella fischeriana Ser.*	Akan 3743, 3654, 3654, 3657, 3662, 3427, 3485, 3495, 3371, 3548, 3305, 4676 3472 4559, 3589, 3588, 4690, 3590, 4744.
M. halophila	*Tirgoneilla halophila Boiss.*	Akan 2850, 2856, 4555.
M. huberi	*Trigonella sirjaevii*	Akan 3465
M. medicaginoides	*Trigonella tenuis* *Trigonella arcuata*	Akan 4718, 3742; 4588, 3504, 3455, 3455, 3528, 3548, 4658, 3262
M. monantha	*Trigonella monantha subsp. incisa* *Trigonella monantha* *Trigonella incisa Benth.*	MNM 1033, 1093, 1209, Akan 206, 4522, 4537, 4534, 4532, 3247, 2778/a, 2783; MNM 1167, 1012, 1061,1176; Korkut 605,382/b; MMB 302, 874, 342, 1016, 1013,1103,1121,1146,1152, 1236, 1344,1391; Aydoğdu 1218, 1139, 1470, 1080.

M. orthoceras	*Trigonella orthoceras*	Akan 724, 3738, 3732, 3722, 3710, 3744, 3707, 3774, 3809, 3658, 3660, 3756, 3437, 3558, 3571, 3213, 4568.
M. pamphylica	*Trigonella pamphylica*	Akan 3331, 3331.
M. phrygia	*Trigonella aurantiaca*	Akan 4636, 3306, 3977, 4643, 4745, 4572, 4696, 3230, MNM 1112, 1133.
M. rigida	*Trigonella rigida*	Akan 4737,4683
M. rostrata	*Trigonella rostrata*	Akan 4661, 3537.
M. isthmocarpa	*Trigonella isthmocarpa*	Akan 4751; Akan 4569
M. rhytidiocarpa	*Trigonella rhytidiocarpa*	Akan 4743; Akan 3590/b, 3590, 4691.
Medicago monspeliaca	*Trigonella monspeliaca*	Akan 3468; MMB 817, 821; MNM 1015, 1164; 1074, 1225; Aydoğdu 1352
Onobrychis oxyodonta var. armena	*Onobrychis armena*	Korkut 560; MNM 1087; MNM 1102; MNM 1290, Aydoğdu 1424; Aydoğu 1407
Scorpiurus subvillosus var. subvillosus	*Scorpiurus muricatus var. subvillosus*	Korkut 168, 495Aydoğdu 1329, 1264, 1416, MNM 1218.
Trifolium infamia-ponertii	*Trifolium intermedium Trifolium angustifolium subsp. intermedium, Trifolium angustifolium subsp. gibellianum*	Akan 1213; MNM 1191; Korkut 431
Trigonella cassia	*Trigonella raphanina*	Akan 2848, 2850; Akan 4535; Akan 3248
Pisum sativum	*Pisum sativum subsp. elatius var. pumilio, Pisum sativum L. subsp. sativum var. arvense*	Aydoğdu,1088, 1147, 1322; MNM 1196, 1288, 1289, 1244; 1422.

Hakem Değerlendirmesi: Dış bağımsız.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemiştir.

Finansal Destek: Bu çalışma Harran üniversitesi HÜBAP tarafından desteklenmiştir (Proje No: 19050).

Yazar Katkıları: Konsept ve dizayn çalışması: A.L., H.A..; Veri Toplama: A.L., H.A.; Veri Analizi/Yorumlama: A.L., H.A.; Makale Taslağı: A.L., H.A.; Makalenin Eleştirel Revizyonu: A.L., H.A.; Nihai Onay ve Sorumluluk: A.L., H.A.; Teknik ve Materyal Desteği: A.L., H.A.; Son Kontol: A.L., H.A.

Teşekkür

Herbaryum çalışmalarımızda yardımcı olan Biyoloji öğretmeni M. Maruf BALOS'a, doktora öğrencisi Cahit ÇEÇEN'e, yüksek lisans öğrencileri Yekta Fıdan BAĞATUR'a, Remziye Yaygın'a ve maddi destek sağlayan HUBAP (Proje no: 19050)'a teşekkür ederim.

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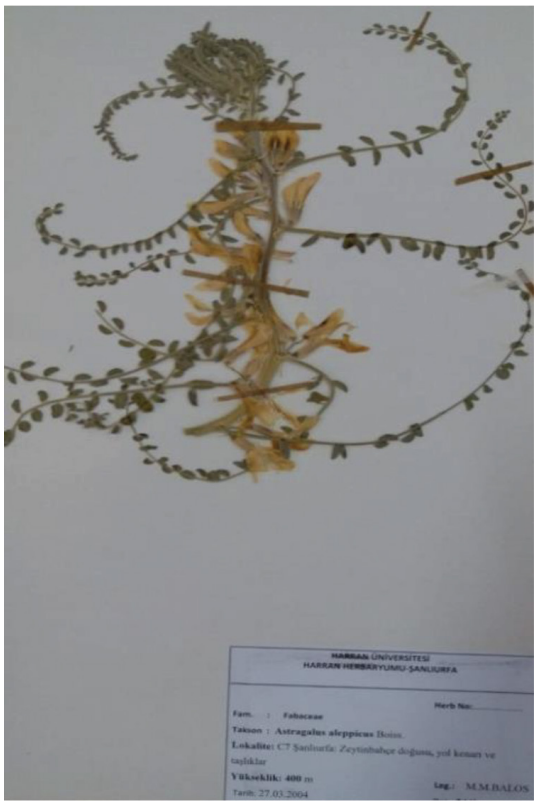
EKLER: HARRAN herbaryum'undaki Fabaceae familyasına ait bazı taksonların fotoğrafları

Şekil 1. *Argyrolobium crotalarioides*

Şekil 2. *Astragalus aduncus*



Şekil 3. *Astragalus aleppicus*

Şekil 4. *Astragalus alopecurus*

Şekil 5. *Astragalus cretaceus*

Şekil 7. *Astragalus decurrens*

Şekil 6. *Astragalus crinitus*

Şekil 8. *Astragalus dipsaceus*

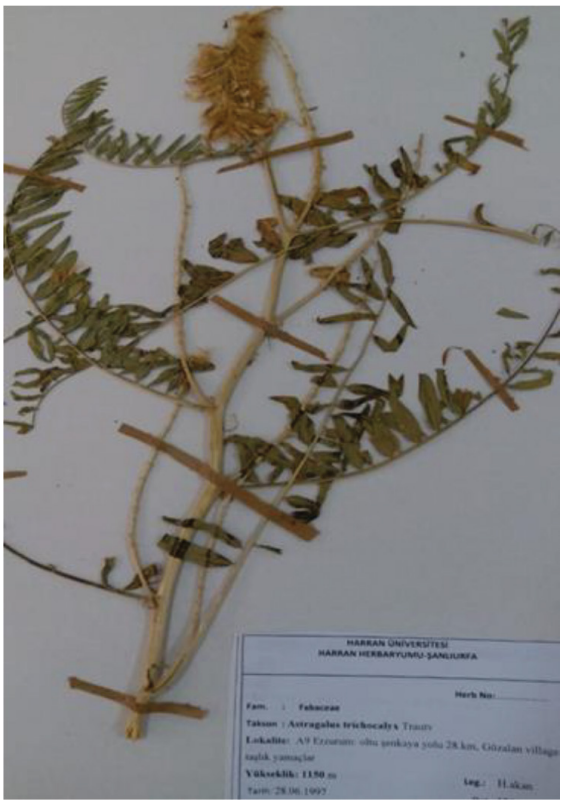
Şekil 9. *Astragalus emarginatus*

Şekil 11. *Astragalus hamosus*

Şekil 10. *Astragalus gymnalopecias*

Şekil 12. *Astragalus lamarckii*

Şekil 13. *Astragalus macrocephalus subsp. macrocephalus*



Şekil 15. *Astragalus petropolitanus*

Şekil 14. *Astragalus oocephalus*

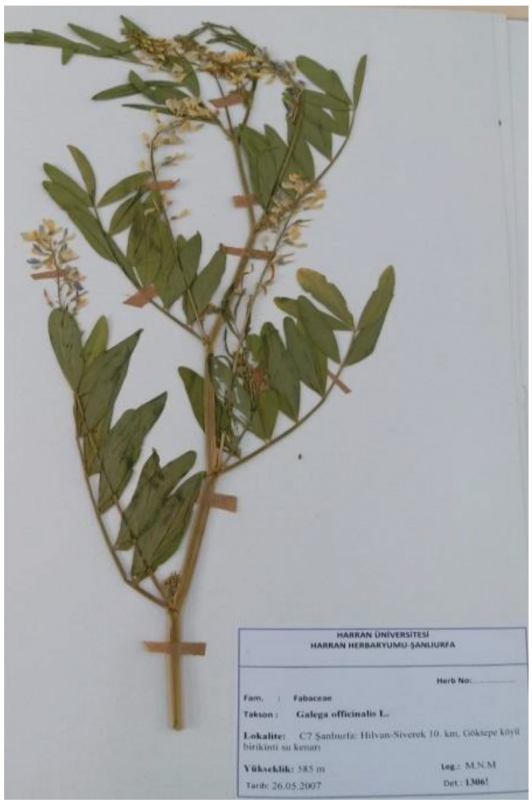
Şekil 16. *Astragalus ponticus*

Şekil 17. *Astragalus russelii*

Şekil 19. *Astragalus suberosus*

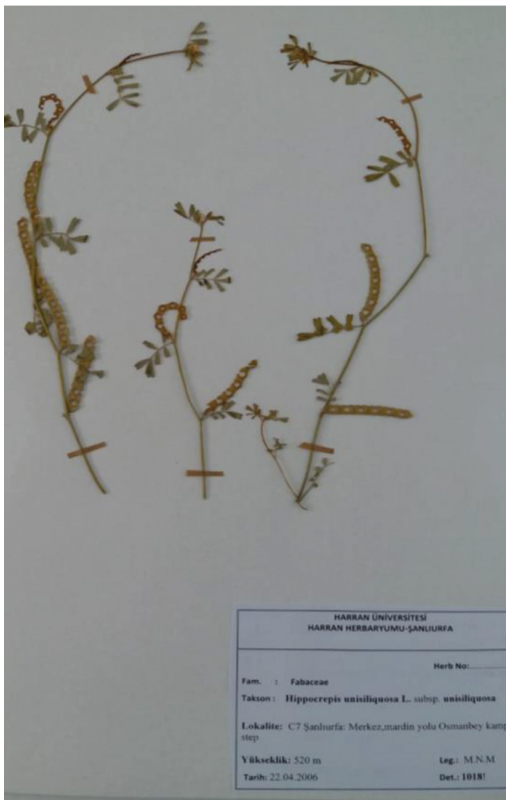
Şekil 18. *Astragalus stojani*

Şekil 20. *Astragalus xylobasis*



Şekil 21. *Galega officinalis*

Şekil 22. H*edysarum pannosum*



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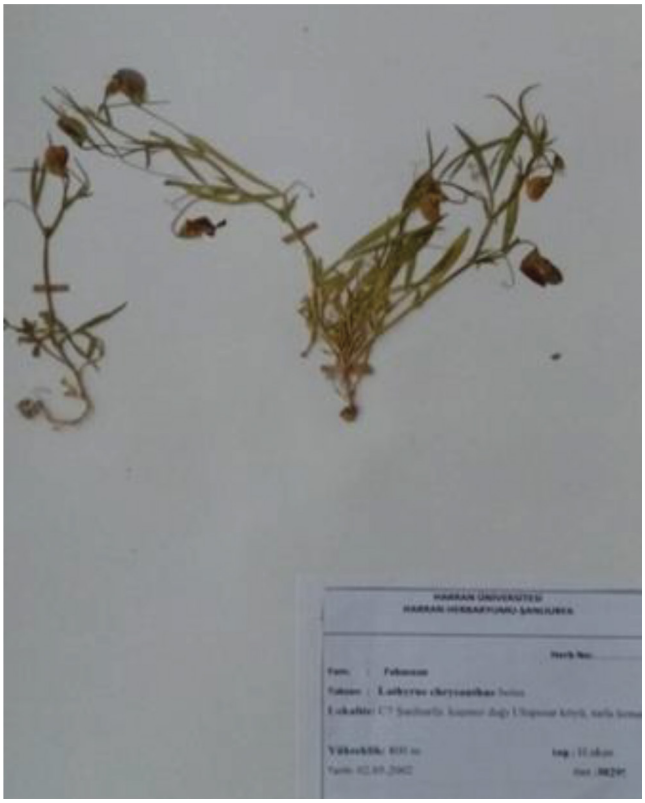
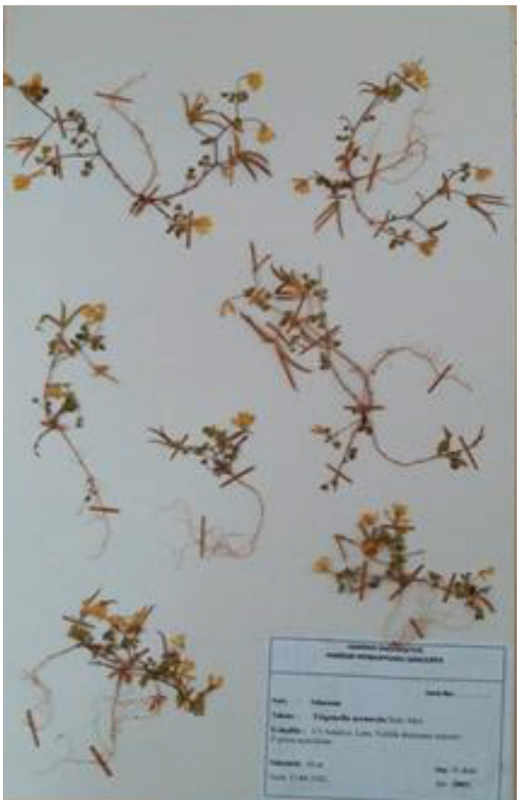


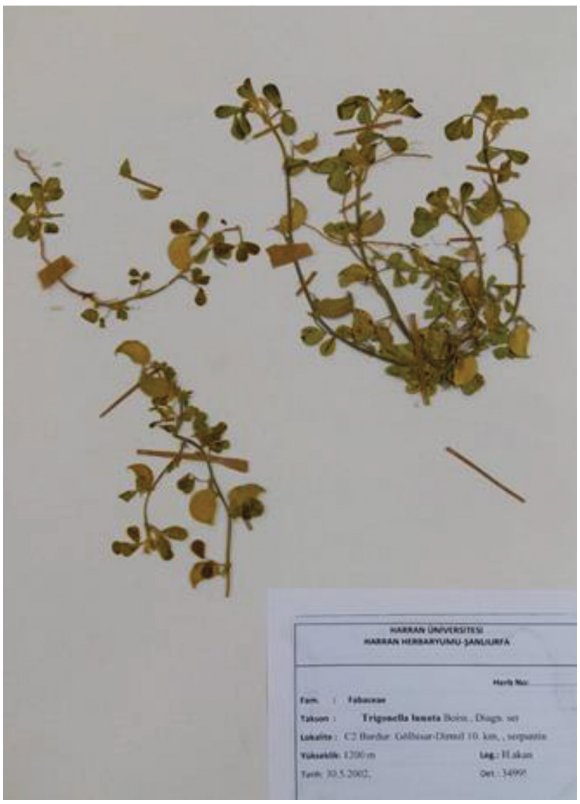
Şekil 24. *Lathyrus chrysanthus subsp. unisiliquosa*

Şekil 25. *Lotus aegaeus*



Şekil 27. *Medicago arenicola*

Şekil 26. *Lotus gebelia. var. gebelia*



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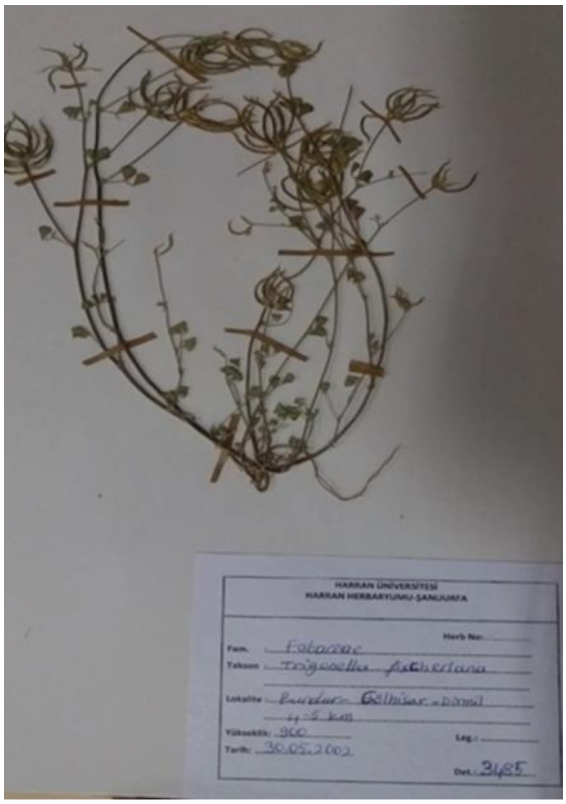

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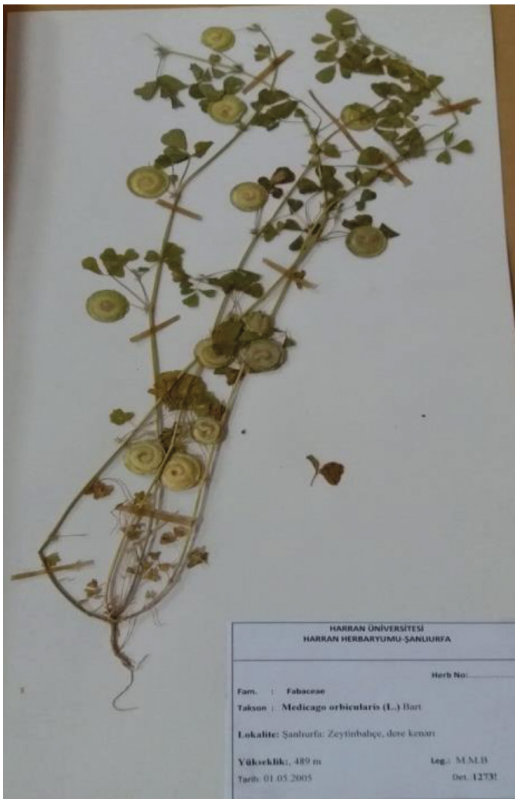
Şekil 31. *Onobrychıs galegifolia*



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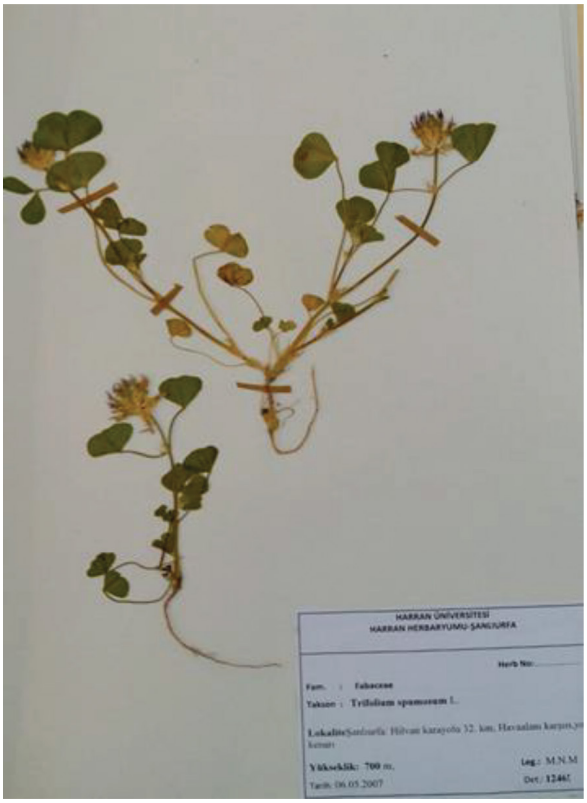

Şekil 32. *Trifolium spumosum*

Şekil 33. *Trifolium purpureum Lois*

Şekil 35. *Trigonella cassia*

Şekil 34. *Trigonella cretica var. purpureum*

Şekil 36. *Trigonella filipes*

Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

İSTANBUL UNIVERSITY PRESS

RESEARCH ARTICLE

Hematologic and Genotoxicological Research on *Pelophylax ridibundus* and *Bufotes variabilis* Living Around the Çan (Çanakkale, Turkey)

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Received: 02.03.2020
Revision Requested: 03.04.2020
Last Revision Received: 15.04.2020
Accepted: 20.05.2020

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Citation: Ozgul, C. N., Kurtul, D., & Gul, C. (2020). Hematological and genotoxicological research on *Pelophylax ridibundus* and *Bufotes variabilis* living around the Çan (Çanakkale, Turkey). *Turkish Journal of Bioscience and Collections*, *4*(2), 105–111.

https://doi.org/10.26650/tjbc.20200011

Abstract

Hematologic parameters play an important role in the determination of the general health status as well as the physiology of amphibian species and the effects of various stress and poor conditions on some species. With this study, changes in the hematological parameters (red blood cell count, white blood cell count, hemoglobin concentration, hematocrit value, mean cell volume, mean cell hemoglobin and mean cell hemoglobin concentration) on an aquatic (*Pelophylax ridibundus*) and a terrestrial (*Bufotes variabilis*) amphibian living around the Çan (Çanakkale, Turkey) were presented. Also, to reveal the DNA damage on these two amphibian species, various nuclear abnormalities like micronucleus, binucleated nucleus, lobbed nucleus, blebbed, and notched nucleus were analyzed.

As a result of this study, the aquatic amphibian species when compared with the terrestrial amphibian species, significant differences in hemoglobin concentration (U= 22.5; W=88.5; Z= -3.446; p= 0.001), and heterophil count (U=34.00; W=205.00; Z= -3.79; p=0.00) were determined. The hemoglobin concentration of the terrestrial species was found higher while the heterophil count of the aquatic species was higher. Total nuclear abnormalities were found higher on the *B. variabilis* species but there was not a significant statistical difference. The micronucleus and other nuclear abnormalities of these two amphibian species when compared, the frequency of the notched nucleus was found statistically different. The frequency of the notched nucleus was higher in the *B. variabilis* species.

Keywords: Amphibia, Hematology, Micronucleus, *Pelophylax ridibundus, Bufotes variabilis*.

Introduction

In recent years, natural resources are in danger of contamination due to the increasing human population and development in technology and industry. Drying of the wetlands and pollution have had a negative effect on species dependent on fresh-water. Understanding poor environmental conditions is important for the sustainability of ecosystems and continuity of species and their quality of life (Çördük *et al.*, 2018). Amphibians and reptiles are adversely affected by pollution and habitat destruction. Amphibians are very sensitive to all types of changes in their aquatic habitats (Cunnigham & Saigo, 1999; Gül *et al.*, 2011).

The number of blood cells in amphibians varies between species (Hutchison & Szarski, 1965; Szarski & Czopek, 1966; Rouf, 1969; Sinha, 1983; Atatür *et al.*, 1999; Cabagna *et al.*, 2005). It has also been reported to be related to body weight, age, sex (Arvy, 1947; Schermer, 1958; Goniakowska, 1973; Sinha, 1983; Banerjee, 1988; Wojtaszek & Adamowicz, 2003), seasons (Zhukova & Kubantsev, 1979; Sinha, 1983; Wojtaszek *et al.*, 1997; Arserim & Mermer, 2008), and the distribution of species by altitude (Ruiz *et al.*, 1989; Gül *et al.*, 2011).

Pollution can also damage the genetic material of organisms. If the damage rate is high, the repair mechanism remains incapable and several mutations can occur in the cells (Dar *et al.*, 2016; Çördük *et al.*, 2018).

Assessment, monitoring, and investigation of the effects of pollutants on the genetic material of organisms has great importance. Genotoxicity can be defined as the ability of chemical, physical or biological agents to cause damage to genetic material. In vitro genotoxicity tests for various organisms have been developed, for monitoring contaminants that may cause mutation on genetic material. With the micronucleus (MN) test, the number of MN formed in cells due to the effects of environmental pollutants can be specified and in this way the genotoxical effects of pollutants can be determined and monitored. The MN test is one of the most widely used biological markers for on-site monitoring of genotoxic pollution (Al-Sabti & Metcalfe, 1995; Bolognesi *et al.*, 2006; Schaumburg *et al.*, 2012; Strunjak-Perovic *et al.*, 2010; Udroiu, 2006). In recent years, nuclear abnormalities (such as the kidney-shaped nucleus, lobbed nucleus, notched nucleus, and blebbed nucleus) and MN test was used for the determination of the effects of pollutants on some species (Ergene *et al.*, 2007; Guilherme *et al.*, 2008; Napierska, 2009; Strunjak-Perovic *et al.*, 2010; Çördük *et al.*, 2018). Also, various studies have identified the presence of MN and nuclear abnormalities in some amphibian species that were exposed to genotoxic pollutants (Marques *et al.*, 2009; Lajmanovich *et al.*, 2014; Josende *et al.*, 2015).

In this study, the red blood cell count (RBC), white blood cell count (WBC), hematocrit value (PCV), mean cell volume (MCV), mean cell hemoglobin (MCH), and mean cell hemoglobin concentration (MCHC), of the aquatic (*P. ridibundus*) and terrestrial (*B. variabilis*) amphibian that live around the Çan, were determined. These parameters were selected to assess the general health status of the two amphibia species and to determine whether or not they carry any infections.

Material and Methods

Study Site and on Site Sampling

Field studies were carried out in 2019 October and 2020 March and May; 16 *P. ridibundus* specimens and 18 *B. variabilis* specimens were collected from around the thermal power plant near Çan. All specimens were captured by hand and scoops. The localities where the specimens were caught is given in Fig. 1.

Morphological Analysis

Within the morphological parameters of collected specimens sex, head+body length (HBL) (with 0.01 mm precision Mitutoyo digital caliper) and body weight (with Sinbo digital scales, max. 3 kg 4570 mg) were measured. For the standardization of the hematological and genotoxicological analyses, similar sized specimens were used. For the hematologic and genotoxicological analysis,

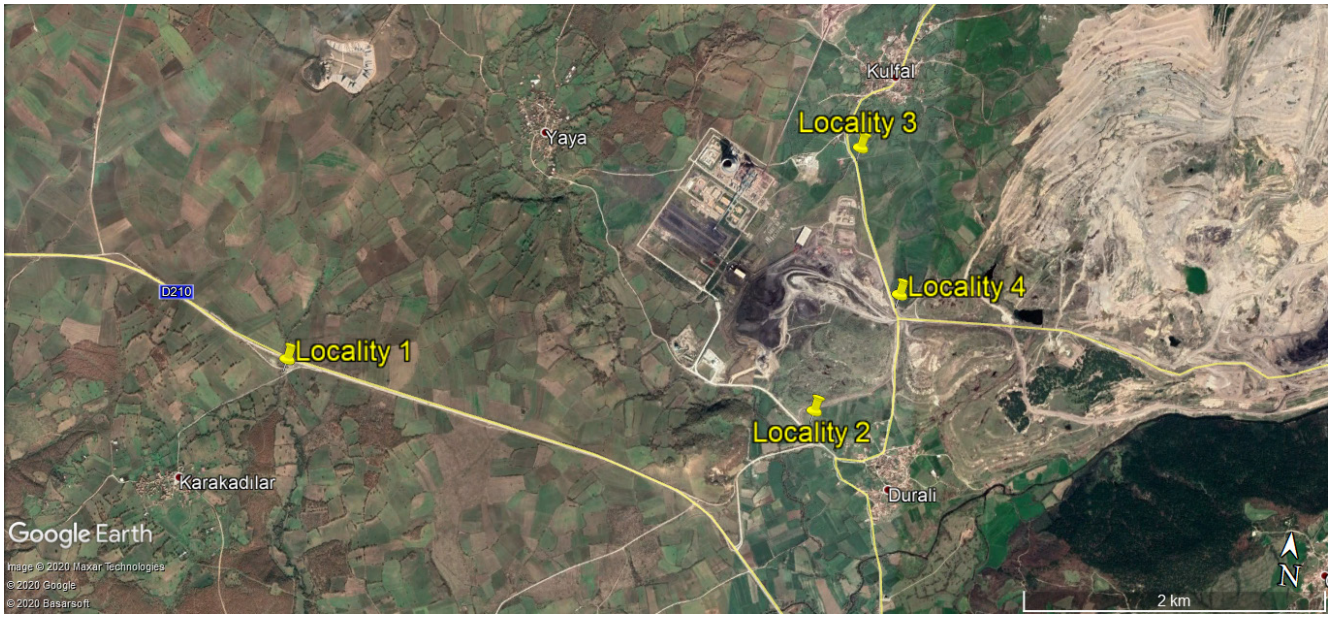

Figure 1. Localities for the specimens (Çan-Çanakkale).
Locality 1: 40° 00' 30.21" N, 26° 56' 43.34" E, 130 m above sea level (a.s.l.); Locality 2: 40° 00' 28.24" N, 26° 59' 04.16" E, 103 m a.s.l.; Locality 3: 40° 01' 28.89" N, 26° 59' 09.93" E, 175 m a.s.l.; Locality 4: 40° 00' 55.63" N, 26° 59' 27.39" E, 166 m a.s.l.

animals were dosed with ether, and blood samples were taken from the middle abdominal vein by heparinized microhematocrit tubes. For these procedures, the necessary permissions were obtained by the 2019/02-09 numbered decision of the local Ethics Committee of Animal Experiments of Çanakkale Onsekiz Mart University.

Hematological Analysis

As part of the hematologic studies, blood smears of these specimens were examined and the percentage of leukocytes in the blood was calculated. The clinical hematology, RBC count, WBC, PVC, MCV and MCHC were examined. In the erythrocyte and leukocyte count, Hayem's solution for erythrocytes and Turk's solution for leukocytes was used as a dilution solution. Blood cell count was measured by the Neubauer hemocytometer under the Olympus 1-15x micrometric oculars. Sahli method was used for determination of hemoglobin concentration (Tanyer, 1985). For the determination of hematocrit value, the blood sample was put into a capillary tube and centrifuged at 2000 rpm for 5 minutes in the microhematocrit centrifuge (Elektro-Mag). The MCV, MCH, MCHC were calculated mathematically by using the obtained results (Tanyer, 1985). Blood smears were prepared for the leukocyte types and these smears were stained with the Wright's stain (Başoğlu & Öktem 1984).

Genotoxicological Analysis and MN Test

For genotoxicological analysis, blood smears were prepared with peripheral blood from each species onto a coverslip cleaned with alcohol. These blood smears were dried at room temperature after fixated with ethanol for 20 minutes. After this procedure, smears were fixed with methanol for 15 minutes and stained with Giemsa stain (10% v/v) (Josende *et al.*, 2015; Çördük *et al.*, 2018). Each preparation of blood smear was examined by microscope (Olympus Cx21 Zeiss Primoster). The MN test was used to determine the number of MN and other nuclear abnormalities in the erythrocytes as a result of environmental pollutants and to monitor the genotoxic effects. The micronucleus detection was done by considering criteria such as; MN must be smaller than one-third of the main nucleus, MN must not be in contact with the main nucleus, MN must be the same color and density as the main nucleus and not be refractive (Heddle & Countryman, 1976; Fenech, 2000; Çördük *et al.*, 2018). Other nuclear abnormalities such as a kidney-shaped nucleus, lobbed nucleus, notched nucleus, blebbed nucleus, and binucleated nucleus were also identified and counted on the blood smears.

Statistical Analysis

In order to perform parametric tests, the data must show normal distribution and be homogeneous (Özdamar, 2004). The Mann-Whitney U test, which is one of the nonparametric tests, was used for data that did not show normal distribution in hematological analyzes. SPSS 20.0 program (IBM) was used for descriptive statistics of genotoxicological and hematological data. In all cases, $p \leq 0.05$ value was considered statistically significant.

Results

When the *P. ridibundus* and *B. variabilis* were measured, the average body weight was found 108 g in *P. ridibundus* and 72 g in the *B. variabilis*. The HBL was found 66.57 mm in *P. ridibundus* and 65.44 mm in *B. variabilis*. (Fig. 2). All data was evaluated together since there were no significant differences between males and females.

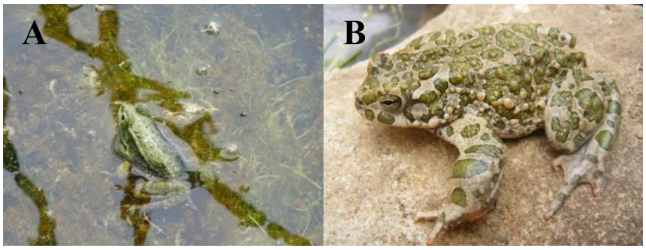

Figure 2. *Pelophylax ridibundus* (A) and *Bufotes variabilis* (B).

Hematological parameters of *P. ridibundus* and *B. variabilis* were given in Table 1. When the hematological parameters between these two amphibian species were compared, the only statistical difference was significant in hemoglobin value (U= 22.5; W=88.5; Z= -3.446; p= 0.001). It was determined that the hemoglobin value was lower in the *P. ridibundus*. When leukocyte percentages of these two specimens were compared, statistical differences were found in the monocyte (U=71.00; W=207.00; Z= -2.51; p=0.01) and heterophil (U=34.00; W=205.00; Z= -3.79; p=0.00) values. It was determined that the number of heterophil was higher in the *P. ridibundus* than the other species, while the number of monocyte and eosinophil was higher in the *B. variabilis*. Leukocyte types in the *P. ridibundus* and *B. variabilis* are given in Fig. 3.

Table 1. Statistics of some hematological parameters and percentage of leukocyte values of *Pelophylax ridibundus* and *Bufotes variabilis* (RBC: the red blood cell count, WBC: white blood cell count, PCV: hematocrit value, MCV: mean cell volume, MCH: mean cell hemoglobin, MCHC: mean cell hemoglobin concentration, Lymph: Lymphocyte, Mon: Monocyte, Het: Heterophil, Bas: Basophil, Eos: Eosinophil, N: number of specimens, SD: Standard Deviation).

	Bufotes variabilis					*Pelophylax ridibundus*				
	N	**Minimum**	**Maximum**	**Mean**	**SD**	**N**	**Minimum**	**Maximum**	**Mean**	**SD**
RBC (mm^3)	15	100000.00	920000.00	186133.33	204569.88	9	104000.00	140000.00	119555.55	11737.87
WBC (mm^3)	16	2600.00	4300.00	3209.37	534.85	8	2200.00	4200.00	3250.00	772.75
Hb (g/dL)	18	7.80	12.60	9.65	1.26	11	3.00	10.20	7.25	1.88
PCV (%)	17	16.00	56.00	38.47	11,05	13	11.00	59.00	36.07	13.08
MCV (μ^3)	14	456.52	4250.00	2609.74	986.34	8	2578.13	4214.29	3565.66	524.56
MCH (μμg)	15	91.30	4887.50	1008.44	1097.12	7	528.57	788.46	663.49	116.53
MCHC (%)	17	19.58	60.00	27.08	10.61	10	12.54	27.27	20.36	5.21
Lymph (%)	18	31.95	78.57	49.70	12.83	16	39.71	67.96	49.88	7.48
Mon (%)	18	3.19	18.12	11.03	4.20	16	2.03	17.09	7.18	4.57
Het (%)	18	1.12	12.28	5.94	4.25	16	6.41	25.82	14.02	5.26
Bas (%)	18	4.59	43.08	23.79	10.51	16	12.28	78.91	24.98	15.87
Eos (%)	18	2.44	25.56	9.44	5.77	16	1.56	9.82	5.56	2.54

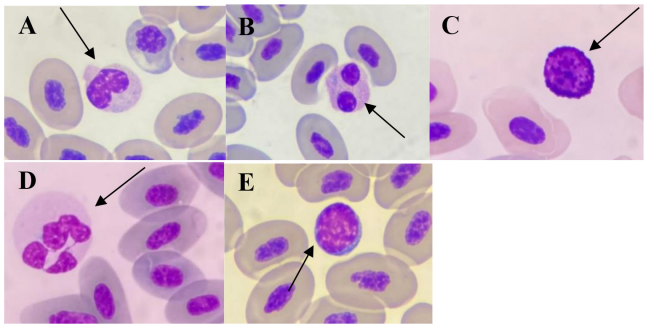

Figure 3. Leukocyte types in the *Pelophylax ridibundus* and *Bufotes variabilis*; Monocyte (A), Eosinophil (B), Basophil (C), Heterophil (D), Lymphocyte (E) (Leukocytes were examined at 1000X magnification).

Table 2. Percentages of the micronucleus and nuclear abnormalities in the *Pelophylax ridibundus* and *Bufotes variabilis* (Mean ± Standard Deviation).

	Bufotes variabilis	*Pelophylax ridibundus*
Micronucleus	0.21±0.16	0.27±0.21
Lobed Nucleus	0.35±0.24	0.32±0.27
Notched Nucleus	2.45±0.70	1.49±0.76
Kidney Shaped Nucleus	1.12±0.71	0.76±0.41
Blebbed Nucleus	1.94±1.20	2.03±0.86
Binucleate	0.05±0.07	0.21±0.60
Total nuclear abnormalities (%)	**6.12±0.99**	**5.08±0.75**

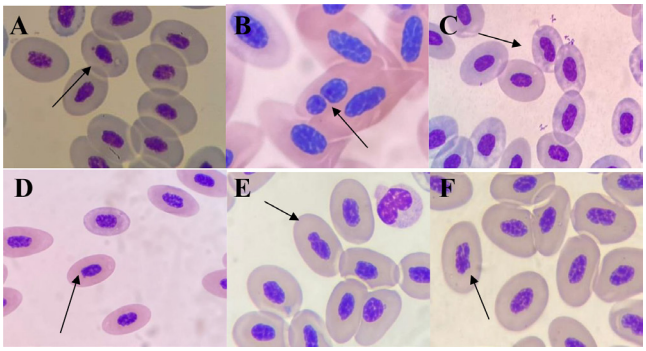

Figure 4. Micronucleus and nuclear abnormalities in *Pelophylax ridibundus* and *Bufotes variabilis*. Micronucleus (A), Binucleate (B), Kidney Shaped Nucleus (C), Blebbed Nucleus (D), Lobed Nucleus (E), Notched Nucleus (F) (Total of 1000 erythrocytes were counted at 1000X magnification.).

The frequency of the MN and nuclear abnormalities in the erythrocytes of *P. ridibundus* and *B. variabilis* were given in Table 2 and Fig. 4. When the MN and nuclear abnormalities of these two species were compared, it was determined that the notched nucleus (U=50.00; W=170.00; Z= -3.07; p=0.002) differ statistically. It was determined that the frequency of notched nucleus in the *B. variabilis* was higher than *P. ridibundus*.

Discussion

The data of the hematological parameters we obtained are following other studies with similar species. In previous

studies (Gül *et al.*, 2011), it has been reported that, among the five anuran species with different habitat choice, the number of erythrocytes is higher in terrestrial (*Bufotes variabilis*) and aquatic (*Pelophylax ridibundus*) species when compared to the semi-aquatic (*Rana dalmatina*) species. Also, in the previous studies, hemoglobin concentration, hematocrit value and some erythrocyte indices (MCV and MCHC) have found higher on the terrestrial species (*Bufotes variabilis*). Similar results were obtained in our study on the terrestrial specimens (*B. variabilis*).

Sils (2008) stated that in his study, *Pelophylax ridibundus* have high levels of heterophil that live in an urban and anthropogenically contaminated environment, when compared with the other representatives of the genus. He also stated, the increase observed in the heterophil and eosinophil ratios can be considered as activation of the protective functions of the blood. According to these results, the effect of the general heterophil increase on amphibians may be seen as an adaptive mechanism that enhances the defensive function of blood while living in a contaminated environment. Considering this information in the literature, the high number of heterophil in aquatic specimens was similar to the previous studies and it could be explained by the fact that the aquatic specimens were more affected by pollution.

Çördük *et al.* (2018) conducted a study for genotoxicological analyses due to pollution in *Pelophylax ridibundus* at different stations. Çördük *et al.* (2018) reported that the total nuclear abnormalities were high in the highly contaminated areas, where industrial, domestic and animal wastes were present, and pollutants in the water damages the organisms' genetic material. They identified the total nuclear abnormality as 8.64 in the highly contaminated area and 3.16 and 3.41 in the less contaminated areas. In our study, total nuclear abnormality of the same species was found as 5.08 so it is between the high and low contaminated areas.

In previous studies, a higher frequency of micronucleus in contaminated areas in *Pelophylax ridibundus* have been found. Gürkan *et al.* (2012) identified the micronucleus frequency as 0.3 in *P. ridibundus* in the area exposed to the genotoxic pesticides used in intensive agricultural activities. In our study, the percentage of MN value of the species collected from the Çan vicinity was found as 0.27. It has been reported that the micronucleus and other nuclear abnormality frequencies in the blood of *P. ridibundus* in contaminated areas were significantly higher than in the clean zone species, high heavy metal levels can lead to toxicity, and the detected genotoxicity may be related to the industrial, agricultural and domestic activities (Şişman *et al.*, 2015). The micronucleus frequency, which has been reported to increase due to pollution in previous literature (Gürkan *et al.*, 2012; Şisman *et al.*, 2015; Çördük *et al.*, 2018), has also been found high in our study region and is thought to be caused by the thermal power plant. There is no detailed study about the MN and other nuclear abnormalities found in the *B. variabilis*; therefore, no comparison has been made.

The results of this study, hematologic and genotoxicological parameters of the terrestrial and aquatic amphibian species showed changes when compared with the literature. Within the hematological parameters of the *P. ridibundus* and *B. variabilis*, the statistical difference was only in the hemoglobin value. When the percentage of leukocyte values were examined, it was determined that there was a significant increase in the number of heterophil in the aquatic *P. ridibundus* when compared to the terrestrial *B. variabilis*. This situation was determined as a cause of pollution. Total nuclear abnormality was observed more in the *B. variabilis* than in the *P. ridibundus*, but there was no statistically significant difference. When the micronucleus and nuclear abnormalities were examined between these two species, a statistical difference was found in the notched nucleus value. And the notched nucleus frequency was higher in the terrestrial species (*B. variabilis*) than in the aquatic species (*P. ridibundus*).

Peer-review: Externally peer-reviewed.

Author Contributions: Conception/Design of study: C.N.O., D.K., C.G.; Data Acquisition: C.N.O., D.K., C.G.; Data Analysis/Interpretation: C.N.O., D.K., C.G.; Drafting Manuscript: C.N.O., D.K., C.G.; Critical Revision of Manuscript: C.N.O., D.K., C.G.; Final Approval and Accountability: C.N.O., D.K., C.G.; Technical or Material Support: C.N.O., D.K., C.G.; Supervision: C.N.O., D.K., C.G.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Financial Disclosure: This paper was supported by TÜBİTAK with 2209-A University Students Research Projects Support Program.

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Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

İSTANBUL UNIVERSITY PRESS

RESEARCH ARTICLE

The Spider Fauna of the Terzioglu Campus of Çanakkale Onsekiz Mart University

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Received: 21.05.2020
Revision Requested: 01.06.2020
Last Revision Received: 20.07.2020
Accepted: 20.08.2020

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Citation: Koru, H., & Tosunoglu, M. (2020). The spider fauna of the terzioglu campus of çanakkale onsekiz mart university. *Turkish Journal of Bioscience and Collections*, *4*(2), 112–121.

https://doi.org/10.26650/tjbc.20200066

Abstract

Çanakkale Onsekiz Mart University Terzioglu Campus was built on an area with different heights and different habitats. The aim of this study was to determine the spider species fauna which were distributed in the campus area due to the lack of any detailed study on spider fauna of the campus area. In this study, the spider fauna of the Terzioglu Campus area of Çanakkale Onsekiz Mart University was investigated between September 2018 and July 2019. The spiders were collected by pitfall traps, sifting and hand aspirators. A total of 86 spider species belonging to 30 families were determined. The most common species in the study area were *Amaurobius erberi* (Keyserling, 1863) and *Pisaura mirabilis* (Clerck, 1957).

Keywords: Aranea, Spider, Fauna, Çanakkale, Turkey

Introduction

Spiders (Arachnida, Araneae) spread around the world 400 million years ago and have conquered all ecological environments (Foelix, 2011). All spiders are carnivores (Foelix, 2011) and they are dominant predators of many living things in the terrestrial ecosystem (Wise, 1995; Bond *et al.*, 2014) and constitute a source of food for vertebrate animals.

Spiders are represented by120 families, 4159 genera and 48424 species in the world (World Spider Catalog, 2020). The first detailed list of the Turkish spider fauna was published by Karol (1967) and contained 302 species of spiders. Recently, Demir & Seyyar (2017) published an updated checklist of spiders in Turkey. Now, the total number of species of Araneae in Turkey is 1129, belonging to 349 genera and 54 families.

Despite the increase in studies on Turkish spiders in recent years, there are still many regions of the country that remain poorly studied. The aim of this preliminary study is to make a contribution to the spider diversity of Turkey.

Material and Methods

Terzioğlu Campus of Çanakkale Onsekiz Mart University is located in the southern part of the Çanakkale Province on an area bordered by the Beldemiz Site in the north, Radar Road in the south, the PTT links in the east and the Çanakkale-İzmir road in the west. The height of the area

varies between 10-280 m and it is located (40° 06′ 43.05”E, 26° 24′ 57.48”N) in a 3-hectare forest area.

As a research area, forest and bush areas in the campus were selected. Spiders were collected between September 2018 and July 2019, by pitfall traps, sifting of leaf litter and hand aspirator methods. The collected samples were placed in labeled tubes containing 70% ethyl alcohol.

The identification of the samples was made by using BOECO BSZ-405 stereomicroscope. The general distribution and taxonomic characteristics of all spider species were followed by Nentwig *et al.*, (2020). In the identification of spider species, the keys of Brignoli (1978), Chatzaki (2002), Deltshev and Blagoev (2001), Marusik (2009), Metzner (2011), Le Peru (2011), Bosmans *et al.* (2013) were used. The specimens are stored in the Zoology Museum of Çanakkale Onsekiz Mart University (COMU-ZM).

Results and Discussion

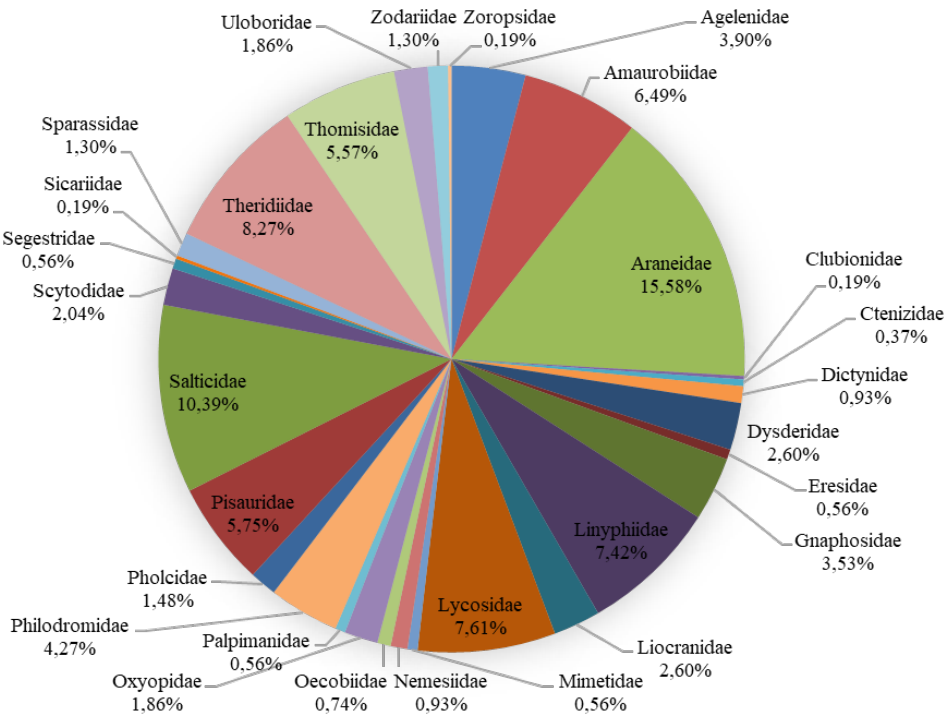
In this study, the spider fauna of the Terzioğlu Campus of Çanakkale Onsekiz Mart University was investigated. The study is a preliminary list of campus spider fauna before the thesis work of the spider fauna in Terzioğlu Campus.
The total number of species of Araneae in Turkey is 1129, belonging to 349 genera and 54 families The Linyphidae family contains 68 genera and are families with the highest species biodiversity in Turkey. The Salticidae family, containing 134 species is the family with the most species (Danısman *et al.*, 2019). In this study, the Salticidae family had the largest number of genera with 12 genera, and the Theridiidae family had the largest number of species with 15 species.
As a result of field studies, 539 specimens were collected and among them 86 species of 30 families were determined. Adult and juvenile individuals belonging to 25 families were encountered from the collected samples. 110 males and 216 females were identified. Adult samples could not be obtained in 5 families from the collected samples and 213 juvenile individuals were identified on a genus level (Table 1). According to the data obtained from the collected individuals, the female/male ratio was 1.96:1 and the adult/juvenile ratio was 1.50:1.

Most of the data obtained in the study was collected from adult and young individuals belonging to the Araneidae family. The Araneidae family consist of diverse small and large taxa (Jäger, 2012; Jones, 1983; Loksa, 1972), and members of the family include species that can build orb-webs between plants, shrubs and tree branches.

Table 1. The spider individuals collected from the Terzioğlu Campus of Çanakkale Onsekiz Mart University

Family	Adult Females	Adult Males	Juveniles
Agelenidae	9	1	11
Amaurobiidae	14	13	8
Araneidae	35	13	36
Clubionidae	-	-	1
Ctenizidae	2	-	-
Dictynidae	-	3	2
Dysderidae	-	1	13
Eresidae	2	-	1
Gnaphosidae	5	6	8
Linyphiidae	23	10	7
Liocranidae	6	7	1
Lycosidae	17	11	13
Mimetidae	1	1	1
Nemesiidae	-	-	5
Oecobiidae	-	-	4
Oxyopidae	2	-	8
Palpimanidae	1	2	-
Philodromidae	12	11	-
Pholcidae	2	3	3
Pisauridae	4	4	23
Salticidae	26	9	21
Scytodidae	11	-	-
Segestridae	2	-	1
Sicariidae	-	-	1
Sparassidae	-	-	7
Theridiidae	24	7	16
Thomisidae	13	6	11
Uloboridae	3	-	7
Zodariidae	2	1	4
Zoropsidae	-	1	-

The ophistosoma structure of the species belonging to the Araneidae family, which has taxon-specific colors and patterns, has a wide variety of appearance and sometimes there is a significant difference in size and color between the sexes (J. Gál *et al.* 2016). The study area consisted of herbaceous and woody plants, as bushes and forested areas provide a suitable habitat for family members to build orb-web and to spread.



Araneidae is currently the third most diverse spider family in the world, containing 3052 species in the genus 178 (World Spider Catalog, 2020). In our country, the Aranediae family is currently the 9th most diverse spider family among 54 families with 58 species (Danışman *et al.*, 2019).

The most abundant and common spiders were, *Amaurobius erberi* (Keyserling, 1863) and *Pisaura mirabilis* (Clerck, 1957). In addition, the collection of the samples in the study area with an aspirator generally enabled the capture of samples that actively navigate the place and build orb-web.

As a result of the field studies, 35 samples belonging to *Amaurobius erberi* (Keyserling, 1863) species were collected. *Amaurobius erberi* (Keyserling, 1863) burrows itself under objects on the ground with a small funnel or tube or a mesh built in tree bark. The openings of the land are made up of stony structures and the bark of the forests provide suitable habitats for the species.

As a result of the field studies, 31 individuals belonging to *Pisaura mirabilis* (Clerck, 1957) were collected. This species walks actively on the ground and hunts free. The study area consisted of herbaceous plants, as shrubs and dead leaves provide a suitable habitats for the species.

Table 2. The list of the spiders of Terzioğlu Campus of Çanakkale Onsekiz Mart University

Family	Genera	Species	Global Distribution	Material Examined
Agelenidae C.L. Koch, 1837	*Agelena* Walckenaer, 1805	*Agelena* sp.		Juveniles: 11♀♀
		Agelena orientalis C.L. Koch, 1837	Italy to Central Asia, Iran	Adults: 2♀♀
	Maimuna Lehtinen 1967	*Maimuna vestita* (C.L. Koch, 1841)	Eastern Mediterranean	Adults: 7♀♀ 1♂♂
Amaurobiidae (Keyserling, 1863)	*Amaurobius* C.L. Koch, 1837	*Amaurobius erberi* (Keyserling, 1863)	Canary Island, Europe, Turkey, Caucasus	Adults: 14♀♀ 13♂♂
		Amaurobius sp.		Juveniles: 8♀♀

Araneidae Clerck, 1757	*Agalenatea* Archer, 1951	*Agalenatea redii* (Scopoli, 1763)	Europe, Turkey, Caucasus, Russia (Europe to South Siberia), Iran, C.Asia, China	Adults: 10♀♀ 1♂♂
	Araneus Clerck, 1757	*Araneus diadematus* Clerck, 1757	Europe, Middle East, Turkey, Caucasus, Russia (Europe to Far East), Iran, Central Asia, China, Japan. Introduced to North America	Adults: 1♂♂
		Araneus sp.		Juveniles: 12♀♀
	Cyclosa Menge, 1866	*Cyclosa sierrae* Simon, 1870	Southern Europe, Hungary, Ukraine, Turkey, Caucasus, Iran	Adults: 7♀♀ 6♂♂
		Cyclosa sp.		Juveniles: 14♀♀
	Gibbaranea Archer, 1951	*Gibbaranea biturberculata* (Walckenaer, 1802)	North Africa, Europe, Turkey, Israel, Russia, Iran, Central Asia to China, Japan, India	Adults: 2♀♀ 1♂♂
		Gibbaranea sp.		Juveniles: 2♀♀
	Glyptogona Simon, 1884	*Glyptogona sextuberculata* (Keyserling, 1863)	Italy to Israel	Adults: 6♀♀ 2♂♂
	Mangora O.Pickard-Cambridge, 1889	*Mangora acalypha* (Walckenaer, 1802)	Madeira, Europe, North Africa, Turkey, Middle East, Caucasus, Russia, C.Asia	Adults: 4♀♀ 2♂♂
	Zilla C.L. Koch, 1834	*Zilla diodia*	North Africa, Europe, Turkey, Caucasus, Russia, Iran	Adults: 1♀♀
		Zilla sp.		Juveniles: 5♀♀ 1♂♂
	Zygiella O.Pickard-Cambridge, 902	*Zygiella keyserlingi* (Ausserer, 1871)	Southern Europe, Ukraine, Turkey	Adults: 5♀♀
		Zygiella sp.		Juveniles: 1♀♀ 2♂♂
Clubionidae Wagner, 1887	*Clubiona* Latreille, 1804	*Clubiona* sp.		Juveniles: 1♂♂
Ctenizidae Thorell, 1887	*Cyrtocarenum* Ausserer, 1871	*Cyrtocarenum cunicularium* (Olivier, 1811)	Greece (incl. Crete, Rhodes), Turkey	Adults: 2♀♀
Dictynidae O.Pickard-Cambridge, 1871	*Brigittea* Lehtinen, 1967	*Brigittea latens* (Fabricius, 1775)	Europe to Central Asia	Adults: 1♂♂
	Dictyna Sundevall, 1833	*Dictyna* sp.		Juveniles: 1♀♀
	Lathys Simon, 1884	*Lathys* sp.		Juveniles: 1♀♀
	Scotolathys Simon, 1884	*Scotolathys simplex* Simon, 1884	Algeria, Spain, North Macedonia, Greece, Ukraine, Israel	Adults: 2♂♂
Dysderidae C.L. Koch, 1837	*Dysdera* Latreille, 1804	*Dysdera crocata* C.L. Koch, 1838	Europe, Caucasus, Iraq, Central Asia. Introduced to North America, Chile, Brazil, Australia, New Zealand, Hawaii	Adults: 1♂♂
	Harpactea Bristowe, 1939	*Harpactea* sp.		Juveniles: 13♂♂
Eresidae C.L. Koch, 1845	*Eresus* Walckenaer, 1805	*Eresus sandaliatus* (Martini & Goeze, 1778)	Europe	Adults: 2♀♀
		Eresus sp.		Juveniles: 1♀♀

Gnaphosidae Pocock, 1898	*Drassodes* Westring, 1851	*Drassodes lapidosus* (Walckenaer, 1802)	Europe, Turkey, Caucasus, Russia, Israel, Iran, Central Asia, China, Korea, Japan	Adults: 1♀♀ 1♂♂
		Drassodes lutescens (C.L. Koch, 1839)	Mediterranean, Ukraine, Caucasus, Russia, Central Asia, Iran, Pakistan	Adults: 1♀♀ 2♂♂
		Drassodes sp.		Juveniles: 7♀
	Nomisia Dalmas, 1921	*Nomisia aussereri* (L. Koch, 1872)	Mediterranean, Eastern Europe, Turkey, Middle East, Caucasus, Russia, Kazakhstan, Central Asia, China	Adults: 1♀♀
		Nomisia sp.		Juveniles: 1♀♀
	Zelotes Gistel, 1848	*Zelotes cingarus* (O.Pickard-Cambridge, 1874)	Albania, North Macedonia, Bulgaria, Greece, Turkey, Tajikistan	Adults: 2♀♀ 1♂♂
		Zelotes subterraneus (C.L. Koch, 1833)	Europe, Turkey, Caucasus, Russia, Central Asia, China	Adults: 2♂♂
Linyphiidae Blackwall, 1859	*Centromerus* Dahl, 1886	*Centromerus albidus* Simon, 1929	Europe, Turkey	Adults: 1♀♀
	Frontinellina Van Helsdingen, 1969	*Frontinellina frutetorum* (C.L. Koch, 1835)	Europe, North Africa, Turkey, Caucasus, Russia (Europe to South Siberia), Iran, Kazakhstan, Central Asia	Adults: 9♀♀
		Frontinellina sp.		Juveniles: 7♀♀
	Gonatium Menge, 1868	*Gonatium cappadocium* Millidge, 1981	Turkey	Adults: 1♀♀
	Neriene Blackwall, 1833	*Neriene furtiva* (O.Pickard-Cambridge, 1871)	Europe, North Africa, Russia (Europe to South Siberia)	Adults: 1♀♀
	Sintula Simon, 1884	*Sintula retroversus* (O.Pickard-Cambridge, 1875)	Europe, Turkey, Caucasus	Adults: 10♀♀ 7♂♂
	Tapinopa Westring, 1851	*Tapinopa gerede* Saaristo, 1997	Turkey	Adults: 1♀♀ 1♂♂
	Walckenaeria Blackwall, 1833	*Walckenaeria alticeps* (Denis, 1952)	Europe, Turkey, Caucasus, Russia (Europe to Middle Siberia), Iran	Adults: 1♂♂
Liocranidae Simon, 1897	*Mesiotelus* Simon, 1897	*Mesiotelus scopensis* Drensky, 1935	North Macedonia, Bulgaria, Greece, Turkey, Iran	Adults: 6♀♀ 7♂♂
		Mesiotelus sp.		Juveniles: 1♀♀
Lycosidae Sundevall, 1833	*Alopecosa* Simon, 1885	*Alopecosa albofasciata* (Brullé, 1832)	Mediterranean to Central Asia	Adults: 12♀♀ 9♂♂
		Alopecosa sp.		Juveniles: 6♀♀ 4♂♂
	Hogna Simon, 1885	*Hogna radiata* (Latreille, 1817)	Europe, Turkey, Caucasus, Russia, Kazakhstan, Iran, Central Asia	Adults: 4♀♀
		Hogna sp.		Juveniles: 3♀♀
	Pardosa C.L. Koch, 1847	*Pardosa hortensis* (Thorell, 1872)	Europe, Turkey, Caucasus, Russia, Iran, Japan	Adults: 1♂♂
	Trabea Simon, 1876	*Trabea paradoxa* Simon, 1876	Southern Europe, Turkey	Adults: 1♂♂
	Trochosa C.L. Koch, 1847	*Trochosa ruricola* (De Geer, 1778)	Europe, Turkey, Caucasus, Russia, Kazakhstan, Iran, Central Asia, China, Japan, Korea, North America, Cuba, Puerto Rico,	Adults: 1♀♀
Mimetidae Simon, 1881	*Ero* C.L. K och, 1836	*Ero flammeola* Simon, 1881	Canary Is., Portugal to Greece (Corfu), Turkey, Israel	Adults: 1♂♂
		Ero sp.		Juveniles: 1♀♀
	Mimetus Hentz, 1832	*Mimetus laevigatus* (Keyserling, 1863)	Mediterranean to Central Asia	Adults: 1♀♀

Nemesiidae Simon, 1889	*Raveniola* Zonstein, 1987	*Raveniola* sp.		Juveniles: 5♂♂
Oecobiidae Blackwall, 1862	*Oecobius* Lucas, 1846	*Oecobius* sp.		Juveniles: 4♀♀
Oxyopidae Thorell, 1870	*Oxyopes* Latreille, 1804	*Oxyopes heterophthalmus* (Latreille, 1804)	Europe, North Africa to Middle East, Turkey, Caucasus, Kazakhstan, China	Adults: 1♀♀
		Oxyopes lineatus Latreille, 1806	Europe, Turkey, Caucasus, Russia (Europe to Central Asia), Middle East, Central Asia	Adults: 1♀♀
		Oxyopes sp.		Juveniles: 7♀♀ 1♂♂
Palpimanidae Thorell, 1870	*Palpimanus* Dufour, 1820	*Palpimanus orientalis* Kulczynski, 1909	Albania, Greece, Turkey	Adults: 1♀♀ 2♂♂
Philodromidae Thorell, 1870	*Pulchellodromus* Wunderlich, 2012	*Pulchellodromus pulchellus* (Lucas, 1846)	Mediterranean	Adults: 4♀♀ 2♂♂
	Thanatus C.L. Koch, 1837	*Thanatus atratus* Simon, 1875	Europe, Turkey, Caucasus, Russia	Adults: 1♀♀
		Thanatus pictus L. Koch, 1881	Europe, Turkey, Caucasus, Russia (Europe to West Siberia), Kazakhstan, Iran	Adults: 1♀♀
		Thanatus vulgaris Simon, 1870	North America, Europe, North Africa, Turkey, Israel, Caucasus, Russia , Iran, Kazakhstan, Central Asia, China, Korea	Adults: 5♀♀ 8♂♂
	Tibellus Simon, 1875	*Tibellus macellus* Simon, 1875	Europe, Turkey, Caucasus, Russia (Europe to Far East), Kazakhstan	Adults: 1♀♀ 1♂♂
Pholcidae C.L. Koch, 1850	*Holocnemus* Simon, 1873	*Holocnemus pluchei* (Scopoli, 1763)	Europe, northern Africa	Adults: 2♀♀ 3♂♂
		Holocnemus sp.		Juveniles: 1♀♀ 2♂♂
Pisauridae Simon, 1890	*Pisaura* Simon, 1886	*Pisaura mirabilis* (Clerck, 1757)	Europe, Turkey, Middle East, Caucasus, Russia, Central Asia, China	Adults: 4♀♀ 4♂♂
		Pisaura sp.		Juveniles: 21♀♀ 2♂♂

Salticidae Blackwall, 1841	*Carrhotus* Thorell, 1891	*Carrhotus* sp.		Juveniles: 1♀♀
	Euophrys C.L. Koch, 1834	*Euophrys frontalis* (Walckenaer, 1802)	Europe, Turkey, Caucasus, Russia, Kazakhstan, Iran, Central Asia, China, Korea, Japan	Adults: 1♂♂
		Euophrys rufibarbis (Simon, 1868)	Southern Europe, N.Africa, Turkey, China	Adults: 3♀♀ 1♂♂
		Euophrys sp.		Juveniles: 2♀♀
	Evarcha Simon, 1902	*Evarcha jucunda* (Lucas, 1846)	Canary Is., Mediterranean, Belgium, Germany	Adults: 5♀♀
	Heliophanus C.L. Koch, 1833	*Heliophanus kochii* Simon, 1868	Macaronesia, North Africa, Europe, Turkey, Caucasus, Kazakhstan, Canada, USA	Adults: 1♀♀ 1♂♂
	Menemerus Simon, 1868	*Menemerus semilimbatus* (Hahn, 1829)	Canary Is., Mediterranean, E.Europe, Turkey, USA,Caucasus, Iran, Argentina, Chile	Adults: 6♀♀ 2♂♂
	Neon Simon, 1876	*Neon* sp.		Juveniles: 3♀♀
	Pellenes Simon, 1876	*Pellenes brevis* (Simon, 1868)	Portugal, Spain, France, Italy, Germany, Bulgaria, Macedonia, Greece, Ukraine, Turkey, Cyprus, Iran	Adults: 1♂♂
		Pellenes sp.		Juveniles: 4♀♀ 5♂♂
	Philaeus Thorell, 1869	*Philaeus chrysops* (Poda, 1761)	Europe, North Africa to Middle East, Turkey, Caucasus, Russia, Iran, Central Asia, Korea Afghanistan, China, Mongolia,	Adults: 5♀♀
	Phlegra Simon, 1876	*Phlegra* sp.		Juveniles: 1♀♀
	Pseudeuophrys Dahl, 1912	*Pseudeuophrys lanigera* (Simon, 1871)	Europe, Turkey, Caucasus, USA	Adults: 5♀♀
	Saitis Simon, 1876	*Saitis* sp.		Juveniles: 4♀♀
		Saitis tauricus Kulczynski, 1905	Italy, Hungary, N.Macedonia, Bulgaria, Greece, Turkey, Ukraine	Adults: 1♀♀ 3♂♂
	Salticus Latreille, 1804	*Salticus* sp.		Juveniles: 1♀♀
Scytodidae Blackwall, 1864	*Scytodes* Latreille, 1804	*Scytodes thoracica* (Latreille, 1802)	Europe, North Africa, Turkey, Iran, Asia to China, Korea, Japan, N.America, Argentina, India, Australia, New Zealand	Adults: 11♀♀
Segestriidae Simon, 1893	*Segestria* Latreille, 1804	*Segestria senoculata* (Linnaeus, 1758)	Europe, Turkey, Caucasus, Iran	Adults: 2♀♀
		Segestria sp.		Juveniles: 1♀♀
Sicariidae Keyserling, 1880	*Loxosceles* Heineken & Lowe, 1832	*Loxosceles* sp.		Juveniles: 1♀♀
Sparassidae Bertkau, 1872	*Micrommata* Latreille, 1804	*Micrommata* sp.		Juveniles: 7♀♀

Theridiidae Sundevall, 1833	*Achaeridion* Wunderlich, 2008	*Achaeridion conigerum* (Simon, 1914)	Europe, Turkey	Adults: 1♀♀
	Asagena Sundevall, 1833	*Asagena phalerata* (Panzer, 1801)	Europe, Turkey, Caucasus, Russia, Kazakhstan, Iran, C.Asia, China, Korea	Adults: 1♂♂
	Enoplognatha Pavesi, 1880	*Enoplognatha afrodite* Hippa & Oksala, 1983	Southern Europe	Adults: 1♀♀
		Enoplognatha sp.		Juveniles: 2♀♀
	Episinus Walckenaer, 1809	*Episinus* sp.		Juveniles: 1♂♂
	Euryopis Menge, 1868	*Euryopis episinoides* (Walckenaer, 1847)	Mediterranean to Turkey, Israel, Reunion, India, China	Adults: 1♀♀ 2♂♂
	Kochiura Archer, 1950	*Kochiura aulica* (C.L. Koch, 1838)	Cape Verde Is., Canary Is., N.Africa, Europe, Turkey, Caucasus, Iran	Adults: 1♀♀
		Kochiura sp.		Juveniles: 3♀♀
	Neottiura Menge, 1868	*Neottiura herbigrada* (Simon, 1873)	Madeira, Mediterranean, Ukraine, China, Korea	Adults: 1♀♀
	Parasteatoda Archer, 1946	*Parasteatoda lunata* (Clerck, 1757)	Europe, Turkey, Israel, Caucasus, Russia, Iran	Adults: 1♀♀
	Pholcomma Thorell, 1869	*Pholcomma gibbum* (Westring, 1851)	Europe, North Africa, Turkey, Azerbaijan,	Adults: 1♂♂
	Steatoda Sundevall, 1833	*Steatoda albomaculata* (De Geer, 1778)	North America, Europe, North Africa to Israel, Russia, Iran, Kazakhstan, Central Asia, China, Korea, Japan	Adults: 3♀♀
		Steatoda paykulliana (Walckenaer, 1806)	Europe, Mediterranean to Central Asia	Adults: 5♀♀
		Steatoda triangulosa (Walckenaer, 1802)	Europe, Turkey, Caucasus, Russia (Europe to Far East), Kazakhstan, Iran, Central Asia. Introduced to Canada, USA, Canary Is.	Adults: 4♀♀
		Steatoda sp.		Juveniles: 3♀♀
	Theridion Walckenaer, 1805	*Theridion adrianopoli* Drensky, 1915	North Macedonia, Bulgaria, Albania, Greece, Turkey	Adults: 3♀♀ 1♂♂
		Theridion betteni Wiehle, 1960	Europe, Turkey	Adults: 1♂♂
		Theridion melanurum Hahn, 1831	Macaronesia, North Africa, Europe, Turkey, Caucasus, Russia , USA	Adults: 2♀♀ 1♂♂
	Theridion Walckenaer, 1805	*Theridion mystaceum* L. Koch, 1870	Europe, Turkey, Russia (Europe to South Siberia), China	Adults: 1♀♀
		Theridion sp.		Juveniles: 3♀♀ 4♂♂

Thomisidae Sundevall, 1833	*Heriaeus* Simon, 1875	*Heriaeus sp.*		Juveniles: 1♀♀
	Monaeses Thorell, 1869	*Monaeses israiliensis* Levy, 1973	Greece, Turkey, Israel, Lebanon, Iran, Central Asia, China	Adults: 2♀♀
		Monaeses sp.		Juveniles: 1♂♂
	Ozyptila Simon, 1864	*Ozyptila atomaria* (Panzer,1801)	Europe, Turkey, Caucasus, Russia (Europe to Far East), Kazakhstan, Iran, Central Asia, China, Korea, Japan	Adults: 1♀♀
		Ozyptila confluens (C.L. Koch, 1845)	Southern Europe, Syria	Adults: 1♀♀
		Ozyptila sanctuaria (O.Pickard-Cambridge, 1871)	Europe	Adults: 2♂♂
		Ozyptila tricoloripes Strand, 1913	Turkey, Israel, Iran, Azerbaijan, Turkmenistan, Kazakhstan	Adults: 2♀♀ 3♂♂
	Synema Simon, 1864	*Synema globosum* (Fabricius, 1775)	Europe, Turkey, Caucasus, Russia, Israel, Iran, Central Asia, China, Korea, Japan	Adults: 1♀♀
	Thomisus Walckenaer, 1805	*Thomisus* sp.		Juveniles: 2♀♀
	Tmarus Simon, 1875	*Tmarus* sp.		Juveniles: 1♀♀ 1♂♂
	Xyticus C.L. Koch, 1835	*Xyticus acerbus* Thorell, 1872	Europe to Central Asia, Russia (Europe to Far East)	Adults: 1♀♀
		Xysticus cristatus (Clerck, 1757)	Europe, Turkey, Caucasus, Russia, Iran, Central Asia, China, Korea, Japan	Adults: 1♀♀
		Xysticus kochi Thorell, 1872	Europe, Mediterranean to Central Asia	Adults: 1♀♀ 1♂♂
		Xysticus luctuosus (Blackwall, 1836)	North America, Europe, Turkey, Caucasus, Russia, Kazakhstan, Iran, Central Asia	Adults: 1♀♀
		Xysticus sp.		Adults: 5♀♀
Uloboridae Thorell, 1869	*Uloborus* Latreille, 1806	*Uloborus* sp.		Juveniles: 7♀♀
		Uloborus walckenaerius Latreille, 1806	Madeira, Europe, Turkey, Caucasus, Russia (Europe to Far East), Iraq, Iran, Central Asia, China, Korea, Japan	Adults: 3♀♀
Zodariidae Thorell, 1881	*Zodarion* Walckenaer, 1826	*Zodarion bigaense* Bosmans, Özkütük, Varli & Kunt, 2014	Turkey	Adults: 2♀♀
		Zodarion morosum Denis, 1935	North Macedonia, Bulgaria, Albania, Greece, Turkey, Ukraine, Russia (Europe, Caucasus)	Adults: 1♂♂
		Zodarion sp.		Juveniles: 3♀♀ 1♂♂
Zoropsidae Bertkau, 1882	*Zoropsis* Simon, 1878	*Zoropsis lutea* (Thorell, 1875)	Croatia, Greece, Bulgaria, Ukraine, Turkey, Syria, Lebanon, Israel, Iran	Adults: 1♂♂

Peer-review: Externally peer-reviewed.

Author Contributions: Conception/Design of study: H.K., M.T.; Data Acquisition: H.K.; Data Analysis/ Interpretation: H.K.; Drafting Manuscript: H.K.; Critical Revision of Manuscript: H.K., M.T.; Final Approval and Accountability: H.K.; Technical or Material Support: H.K., M.T.; Supervision: H.K.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Financial Disclosure: This paper was supported by TÜBİTAK with 2209-A University Students Research Projects Support Program.

Acknowledgement: The present study is based on a part of the master thesis "The Spider Fauna of the Tezioğlu Campus of Çanakkale Onsekiz Mart University" (Çanakkale Onsekiz Mart University, Turkey) of the first author.

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Turkish Journal of Bioscience and Collections
Volume 4, Number 2, 2020
E-ISSN: 2601-4292

İSTANBUL UNIVERSITY PRESS

RESEARCH ARTICLE

Herpetofaunal Diversity of Çanakkale Southwest Coastal Zones

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Received: 11.06.2020
Revision Requested: 18.06.2020
Last Revision Received: 21.07.2020
Accepted: 17.08.2020

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Citation: Boran, B., Uysal, I., & Tosunoglu, M. (2020). Herpetofaunal diversity of çanakkale southwest coastal zones. *Turkish Journal of Bioscience and Collections*, *4*(2), 122–128.

https://doi.org/10.26650/tjbc.20200088

Abstract

Along with the literature information obtained from previous studies, the determination of species in herpetofauna studies gives information about the herpetofauna of the research area. Researching the herpetofauna of regions is very important in terms of conservation of species, revealing biodiversity, identifying possible threats, and determining the preventitive measures to be taken against these threats.

The study area is the southwestern coastal regions of Çanakkale, which is also the westernmost coast of Anatolia. This area consists of the localities of Ahmetçe, Sazlı, Kozlu, Behram, Bektaş, Koyunevi, Babakale, Gülpınar, Tuzla, Kösedere, and Tavaklı. Because it has the potential to be a coastline separated by the end of the Kaz Mountains, this study area has different habitats and has the potential to host species that exceed isolation of the Kaz Mountains.

In this study, the amphibian and reptile diversity of terrestrial and aquatic areas along the coast of Southwest Anatolia starting from the end of the Kaz Mountains, which is the habitat preferences of the species, and the effects of environmental and anthropogenic factors on the herpetofauna of the region were investigated. A total of 5 amphibian species and 16 reptile species have been identified in the southwestern coastal areas of Çanakkale, and the *Testudo graeca* species are vulnerable according to the IUCN categories.

Keywords: Amphibia, Reptilia, Biodiversity, Çanakkale, Turkey

Introduction

Turkey, which serves as both a bridge and a barrier between the continents of Asia and Europe, contains a large number of living species because it has different topographic, geological, and climatic characteristics and different habitat types (Özcan, 2012). Turkey has a rich variety of species with European origin from Thrace, Asian origin from the Caucasus and eastern Anatolia, and African origin from Syria and Iraq (Demirsoy, 1996). Knowing the geographical distribution of species is extremely important in terms of conservation and management of biodiversity (Margules & Pressey, 2000).

Herpetological studies in Turkey mostly focus on the research of large regions and include the identification of species (Werner, 1902; Venzmer, 1922; Bird, 1936; Bodenheimer, 1944; Başoğlu & Özeti, 1973, Başoğlu & Baran, 1977; Baran *et al*., 2012). All these studies enable us to have information about the herpetofauna of the region (Başoğlu, 1947; Kosswig, 1951; Mertens, 1952a, 1952b, 1953; Göçmen *et al*., 1996; Baran *et al*., 1997; Kumlutaş *et al*., 1999; Kete & Yılmaz, 2000; Kumlutaş *et al*., 2000; Sindaco *et al*., 2000; Erdoğan *et al*., 2002; Göçmen *et al*., 2003; Kumlutaş *et al*., 2004; Ilgaz & Kumlutaş, 2005; Kır, 2005; Ayaz *et al*., 2006; Uğurtaş *et al*., 2007; Hür *et al*., 2008; Budak & Göçmen, 2008; Ilgaz, 2009; Tosunoğlu *et al*., 2009; Kumlutaş *et al*., 2011; Baran *et al*., 2012; Tosunoğlu *et al*., 2017; Baycan, 2018).

Çanakkale is located in the southern part of the Marmara region, in northwestern Turkey. Çanakkale

province has a high amount of amphibia and reptile richness due to the fact that it has territories in both the Thrace and Anatolia regions, in different biotopes, and in different ecological areas (Başoğlu *et al*., 1977; Baran, 1981; Kaya, 2005; Tosunoğlu *et al*., 2009; Bulut, 2010; Uysal *et al*., 2011; Baran *et al*., 2012; Tosunoğlu *et al*., 2012; Gül and Tosunoğlu, 2013; Tok and Çiçek, 2014; Tosunoğlu *et al*., 2017; Tok *et al*., 2018). The southwestern coastal regions of Çanakkale consist of the localities of Ahmetçe, Sazlı, Kozlu, Behram, Bektaş, Koyunevi, Babakale, Gülpınar, Tuzla, Kösedere and Tavaklı, which are the westernmost parts of Anatolia. These areas have the potential to host species that exceed the isolation of the Kaz Mountains.

This study determined the presence of amphibian and reptile species along the coast of Southwest Anatolia, these species' habitat preferences, and their distribution limits, which are likely to pass through the isolation of the Kaz Mountains. During field studies, potential threat factors were identified for the amphibian and reptile species distributed in the region. In addition, in previous studies sea turtle nests have been identified in Babakale (Başkale *et al*., 2018), therefore the shores of southwestern Çanakkale were investigated if there are sea turtle nests.

Material and Methods

In this study, amphibian and reptile species were identified in the southwestern coastal regions of Çanakkale (Ahmetçe, Sazlı, Kozlu, Behram, Bektaş, Koyunevi, Babakale, Gülpınar, Tuzla, Kösedere, Tavaklı) and in the surrounding terrestrial areas and wetlands (Fig. 1).

During the field studies, the location, time, vegetation, and physical characteristics of the land were taken into account in determining the location of the animals. Field studies were conducted in August 2019-May 2020 with a team of 3 people. Direct observation took place between the hours of 08:00-11:30 in the morning and 15:30-19:00, and species and habitats that the species live in were recorded by photographs (Fig. 2).

Figure 1. Map of the study area (Red areas include the research area)

Figure 2. Field studies

In the field studies carried out, amphibian species were collected by scoop and hand from aquatic areas, puddles, under stones, and from cool and moist areas such as tree trunks. Concerning reptile species, turtle species were caught by scoops or eel-buck, and tortoises were caught by hand. Lizards were caught by hand without holding the tail while snake species were caught with hand or with a snake stick.

The coordinates and altitudes of the localities that species were identified were recorded in the study by using the Garmin Vista Global Positioning system tool. The observed and captured samples were photographed first with a Canon brand digital camera, and the identification of the captured species was made using various books (Baran & Atatür, 1998; Baran *et al*., 2012; Başoğlu & Baran, 1977, 1980; Özeti & Yılmaz, 1994, Tosunoğlu *et al*., 2017).

Results

Out of a total of 9 amphibian species and 36 reptile species distributed in the province of Çanakkale, 5 amphibian species (1 urodelan and 4 anurans), and 16 reptile species (3 turtles, 7 lizards and, 6 snakes) were found (Table 1). When the species identified in the study were examined according to IUCN criteria (2020-1), 18 species were found to be in the categories of 'Least Concern' (LC), 1 species 'Data Deficient' (DD), 1 species 'Vulnerable' (VU), and 1 species 'Near Threatened' (NT).

Table 1. Amphibian and reptile species detected in southwestern coastal regions of Çanakkale province.

Order	Family	Species of Çanakkale Province	Species Detected in Southwest Coastal Regions	IUCN Categories	Corotype	Habitat Types
Urodela	Salamandridae	*Lissotriton vulgaris*	+	LC	Mediterranean	W
		Ommatotriton ophryticus	-	NT	Turano-Mediterranean	P, W
		Triturus ivanbureschi	-	LC	E- Mediterranean	P, W
Anura	Ranidae	*Pelophylax ridibundus*	+	LC	Turano-Europeo-Mediterranean	W
		Rana dalmatina	-	LC	Euro-Siberian	F, W
	Bufonidae	*Bufo bufo*	+	LC	European	A, M
		Bufotes variabilis	+	*DD*	Turano-Europeo-Mediterranean	B, A, P
	Hylidae	*Hyla orientalis*	+	LC	Europeo-Mediterranean	B, P
	Pelobatidae	*Pelobates syriacus*	-	LC	Turano-Mediterranean	A
Chelonia	Chelonidae	*Caretta caretta*	-	*VU*	Cosmopolitan	S
		Chelonia mydas	-	*EN*	Cosmopolitan	S
	Emydidae	*Emys orbicularis*	+	*NT*	Turano-Europeo-Mediterranean	W
		Trachemys scripta	-	*DD*	Invasive	W
	Geoemydidae	*Mauremys rivulata*	+	*DD*	Turano-Mediterranean	W
	Testudinidae	*Testudo graeca*	+	*VU*	Turano-Mediterranean	F, B, A, P
		Testudo hermanni	-	*NT*	European	F, B, A, P
Lacertilia	Agamidae	*Stellagama stellio*	+	*LC*	E- Mediterranean	R
	Anguidae	*Anguis fragilis*	-	*DD*	European	A
		Pseudopus apodus	+	*DD*	Turano-Mediterranean	F, A, P
	Gekkonidae	*Mediodactylus kotschyi*	+	*LC*	E- Mediterranean	F, A, P, R
		Hemidactylus turcicus	+	*LC*	Mediterranean	F, A, P, R
	Lacertidae	*Anatololacerta anatolica*	-	*LC*	SW-Anatolian Endemic	R, F, B
		Lacerta trilineata	+	*LC*	E- Mediterranean	F, A, P, B
		Lacerta viridis	-	*LC*	E-European	F, A, P, B
		Ophisops elegans	+	*DD*	E- Mediterranean	B, A, P
		Podarcis tauricus	-	*LC*	E- Mediterranean	R, F, B, A
		Podarcis muralis	-	*LC*	S-European	R, F, B, A
		Podarcis siculus	-	*LC*	Mediterranean	R, F, B, A
	Scincidae	*Ablepharus kitaibelii*	-	*LC*	E- Mediterranean	F, A, P
		Heremites auratus	+	*LC*	SW-Asiatic	F, A, P

Ophidia	Boidae	*Eryx jaculus*	+	*LC*	Mediterranean	F
	Colubridae	*Coronella austriaca*	-	*DD*	European	F, R
		Dolichophis caspius	+	*DD*	Turano-Mediterranean	B, P, A
		Dolichophis jugularis	-	*LC*	SW-Asiatic	B, P, A
		Eirenis modestus	+	*LC*	SW-Asiatic	F, A, P, B
		Elaphe sauromates	-	*DD*	Turano-Mediterranean	A, B, P
		Hemorrhois nummifer	-	*LC*	Turano-Mediterranean	A, B, P
		Malpolon insignitus	-	*LC*	Mediterranean	F, A, P, B
		Platyceps collaris	-	*LC*	E- Mediterranean	B
		Platyceps najadum	-	*LC*	Turano-Mediterranean	F, A, P, B
		Telescopus fallax	-	*LC*	Turano-Mediterranean	F, B
		Zamenis situla	-	*LC*	Turano-Mediterranean	F, B, P, R
	Natricidae	*Natrix natrix*	+	*LC*	Central Asiatic-Europeo-Mediterranean	W
		Natrix tessellata	+	*LC*	Central Asiatic-European	W
	Typhlopidae	*Xerotyphlops vermicularis*	-	*LC*	Turano-Mediterranean	F, B, P
	Viperidae	*Montivipera xanthina*	+	*LC*	E- Mediterranean	R

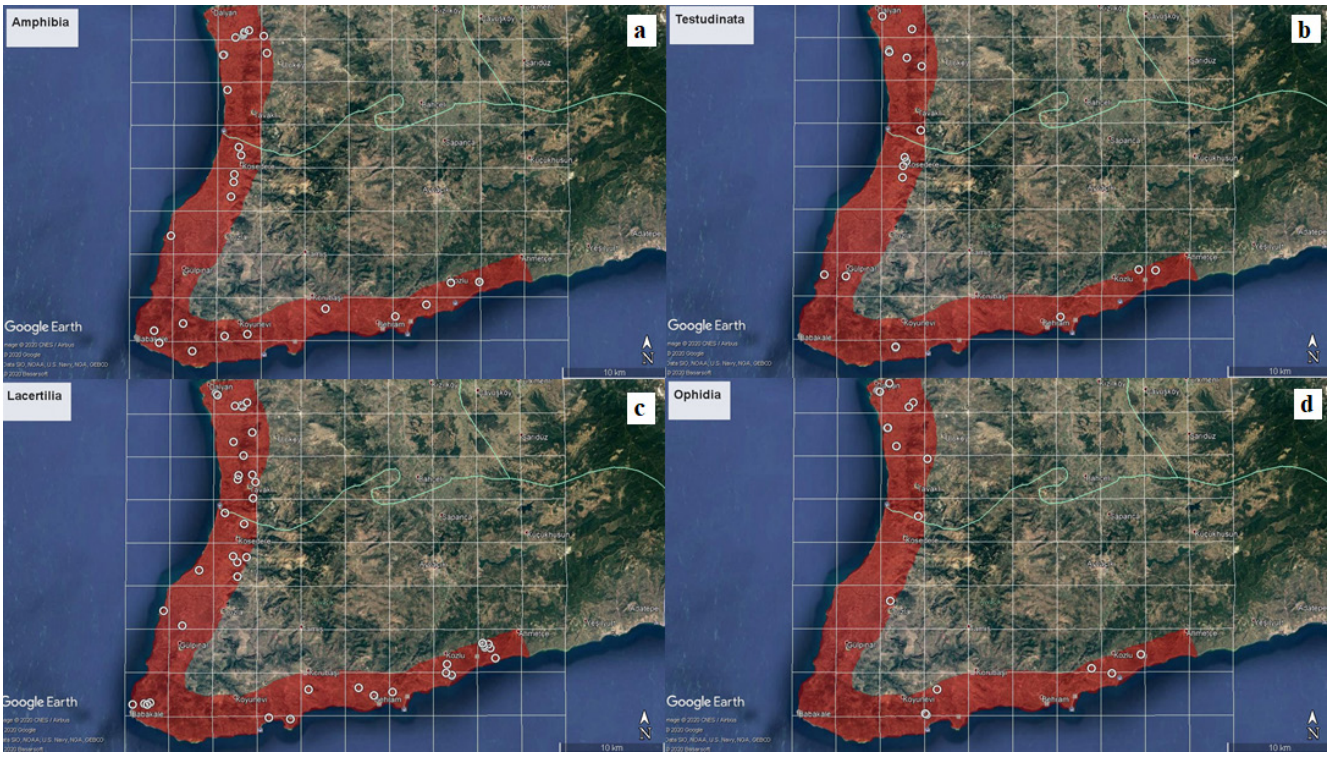

Figure 3. Species identified in the study area (a- Amphibia species, b- Testudinata species, c-Lacertilia species, d-Ophidia species).

Habitat Types: R: Rocky and Stony area, F: Forest, B: Bushes, P: Pasture, A: Agricultural land, W: Wetlands, S: Sea.

Amphibia species are usually found in wetlands, puddles, moist bush bottoms, farmland, and pastures; Testudinata species are found in wetlands, forest, pasture and agricultural land; Lacertilia species have been identified in forests, rocky and stony areas, bushes, and farmland, and Ophidia species have generally been identified in wetlands, bushes, rocky areas, farmland, and pastures. Species identified in the study area have been mapped in detail (Fig. 3).

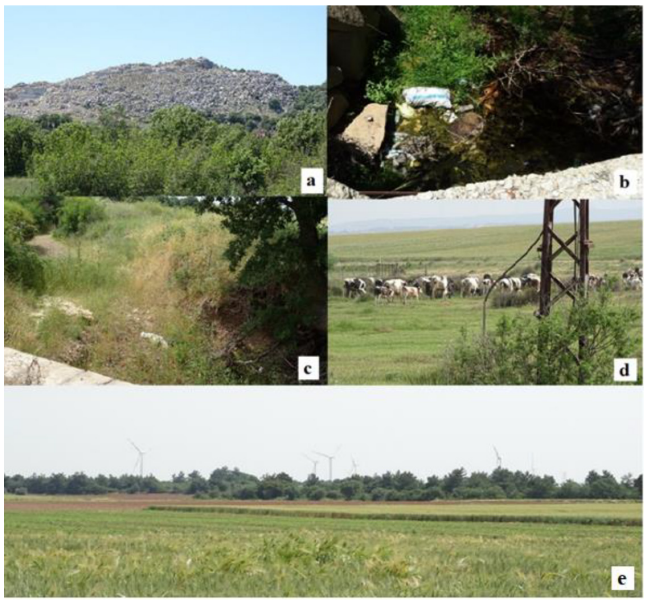

Figure 4. Potential threat factors in the study area (**a**- Quarry, **b**-Environmental Pollution, **c**- Drying of wetlands, **d**-Livestock grazing, **e**- Agricultural fields).

Figure 5. Road deaths of some amphibians and reptiles (**a**-*Dolichophis caspius*, **b**-*Pseudopus apodus*, **c**- *Lacerta trilineata*, **d**-*Eryx jaculus*, **e**-*Testudo graeca*, **f**-*Bufotes variabilis*).

During field studies, it has been found that amphibian and reptile species in the region have been negatively affected by livestock grazing, environmental pollution, drying of wetlands, quarry activities, and increased agricultural areas (Fig. 4).

In addition, due to intensive tourism and agriculture activity in our study area, road deaths of Amphibia and Reptilia species were frequently encountered (Fig. 5).

Discussion

During conveyed field studies in August 2019-May 2020, a total of 21 species, including 5 amphibia species and 16 reptile species, were found in the the southwestern coastal regions of Çanakkale. As a result of observations during the field studies, potential threat factors were identified for amphibian and reptile species that are distributed in the region.

In recent studies, distribution of the species of *Dolichophis jugularis* and *Stellagama stellio* have been found in Çanakkale by overcoming the isolation barrier of the Kaz Mountains (Tosunoğlu *et al*., 2017). *Stellagama stellio* found in the Babakale locality within the boundaries of our study site were found at the extreme point of the coast, and thanks to this project, they were found at the extreme point of the southwest coast of Çanakkale. In the study conducted by Başkale *et al*. (2018), it was reported that there was 1 nest belonging to sea turtles on the Çanakkale-Babakale beach. However, no traces of nests or sea turtles were found on the coasts during the field studies.

Habitat preferences of the identified species have been determined as pastures, agricultural land, forests, wetlands, bushes, and rocky and stony areas. These species were evaluated based on the IUCN (2020-1) criteria, and *Testudo graeca* species in 'Vulnerable' (VU) and *Emys orbicularis* species in 'Near Threatened' (NT) categories were found. Populations belonging to all of the detected species during field studies were distributed throughout the study area. Some road deaths of different species were encountered during the field studies. In previous studies (Akdeniz *et al*., 2012), it has been

determined that sea turtles use the coasts of the Çanakkale to feed and overwinter. Başkale *et al*. (2018) have identified nests of sea turtles in Babakale (Başkale *et al*., 2018), but as a result of our field studies along the coast, it has been determined that there are no nests for sea turtles. This is the first herpetofauna study of the Southwest coasts of Çanakkale. In Çanakkale province, a total of 9 amphibia species and 37 reptile species have been identified (Tosunoğlu *et al*., 2017), and 5 amphibia species and 16 reptile species were found in the study area. According to these data, the study area has a considerable amount of biodiversity richness.

Peer-review: Externally peer-reviewed.

Author Contributions: Conception/Design of study: B.B., I.U., M.T.; Data Acquisition: B.B., I.U., M.T.; Data Analysis/Interpretation: B.B., I.U., M.T.; Drafting Manuscript: B.B., I.U., M.T.; Critical Revision of Manuscript: B.B., I.U., M.T.; Final Approval and Accountability: B.B., I.U., M.T.; Technical or Material Support: B.B., I.U., M.T.; Supervision: B.B., I.U., M.T.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Acknowledgement: This paper was supported by TÜBİTAK with 2209-A University Students Research Projects Support Program.

Financial Disclosure: There are no funders to report for this submission.

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Karasar, N. (1995). *Araştırmalarda rapor hazırlama* (8th ed.) [Preparing research reports]. Ankara, Turkey: 3A Eğitim Danışmanlık Ltd.

b) Book Translated into Turkish

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