Türk. entomol. derg., 1989, 13 (1): 5-14
ISSN 1010-6960

Systematical studies on the Heterogasterinae of Turkey (Heteroptera : Lygaeidae)

Neşe ÇAĞATAY (AYSEV)*

Summary

In the present paper, Heterogaster artemisiae Schl., Heterogaster urticae (F.) Heterogaster cathariae (Geoffr.), Heterogaster affinis H.-S., Platyplax salviae (Schl.) and Platyplax inermis (Rb.) were taxonomically studied.

The male genitalia; pygophore, paramere and phallus of these species which imply very important taxonomic characters were illustrated and described; brief descriptions of their body were also added.

Introduction

The subfamily Heterogasterinae is represented in Turkey by two genera and six species (Hoberlandt, 1955; Tuatay et al., 1972; Lodos et al., 1978). Oedancala dorsalis (Say) from U.S.A., Artemidorus prescus Distand from India, Heterogaster urticae (F.), and Platyplax inermis (Rb.), from Turkey were studied (Ashlock, 1957; Chopra and Rustagi, 1980; Aysev and Şişli, 1976). Characters of the key for the genera were also taken by hand by Scudder (1962). In this work the male genitalia, pygophore, paramere and phallus of Heterogaster artemisia Schl., Heterogaster urticae (F.), Heterogaster cathariae (Geoffr.), Heterogaster affinis H.-S., Platyplax salviae (Schl.) and Platyplax inermis (Rb.) were examined and their systematic importance attempted to be shown. The brief morphologic description and

* Hacettepe Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Ankara, Türkiye

Alınış (Received): 26.9.1988

distributions of them were given with the diagnostic key for all the species of Heterogasterinae recorded from Turkey, Heterogaster urticae and Platyplax inermis were given with the necessary additions, new figures and redescriptions in spite of being worked before by the author (Aysev and Şişli, 1976) to discuss the subfamily extensively. It was not possible to inflate the endosoma because of extrame narrowness of the theca distally; so it is examined but could not be shown in the figures.

Specimens in the collection of Entomology Department of Agricultural Faculty, Ege University, İzmir; in the collection of Plant Protection Institute, Plant Protection Museum, Ankara; and in the collection of Zoology Department of Science Faculty, Hacettepe University, Ankara; contain the material of this work.

Key to the Genera and Species of Heterogasterinae

1. Pronotum with concave lateral margines, fore femora usually with a ventral distinct denticle; paramere as in Fig. 14, dorso-lateral process of pygophore as in Fig. 1 ..... Gen. Heterogaster Schl. 2
- Pronotum with more or less strait margines without concavity, fore femora without denticle; paramere as in Fig. 18, dorso-lateral process of pygophore as in Fig. 17 ..... Gen. Platyplax Fb. 5

2. Fore femora with a distinc denticle 3
- Fore femora without a distinct denticle; 2nd antennal segment (excepting basal parth) and base of 3rd rust coloured; male genitalia as in Fig. 1-4 ..... H. artemisiae (Schl.)

3. Head, pronotum, 2nd antennal segment and tibia with long vertical hairs; male genitalia as in Fig. 5-8 ..... H. urticae (F.)
- Head, pronotum, 2nd antennal segment and tibia with very short fine hairs 4

4. Tibiae black, with a light yellow-white ring medially; hemelytra, dorsal of body usually gray or yellowish gray; male genitalia as in Fig. 9-12 ..... H. cathariae (Geoffr.)
- Tibiae black with two light yellow-white ring medially; hemelytra reddish; male genitalia as in Fig. 13-16 ..... H. affinis H.-S.

5. Gena extending much beyond tip of tylus; male genitalia as in Fig. 17-19 ..... P. salviae (Schl.)
- Gena not reaching to tip of tylus, tylus slightly longer; male genitalia as in Fig. 20-22 ..... P. inermis (Rb.)

Heterogaster Schilling, 1829

Synonymy: Phygas Fieber, 1837; Phygadicus Fieber, 1851, H. artemisia Schilling, 1829

Synonymy: Heterogaster coronillae Kolenati, 1845; Cymus artemisia Assman 1845, Phygadicus artemisia Baerensprung, 1860.

Body with very fine, light coloured hairs; general coloration black and rust coloured-yellow; head black; 1st antennal segment dark brown, distally yellow-brown, 2nd yellow-brown, proximally dark brown; 3rd yellow-brown, proximally dark brown, distally blackish, 4th dark brown with a wide yellow-brown ring proximally; rostrum dark brown, hardly reaching beyond medial part of mesosternum; pronotum proximally yellow

brown, distally black punctured; scutellum brownish-black with a yellow projected median on distal corner; wings yellow-brown with brown punctures, corium very light brown with a spot at distal margin; membrane colourless; paratergites dark brown lateral margines with a yellowish spot; body dark-brown ventrally; coxae black; 1st femur dark brown-black, distally brownish yellow, 2nd and 3rd femora brownish-yellow with a black ring medially; tibiae proximally yellowish, distally black with complete or incomplete black ring; tarsi yellowish, with 3rd segment dark brown; 5-5.5 mm in lenght.

Pygophore longer than broad; distally convex, with a thin lightly pigmented narrow plates like a projection; lateral faces straight, more than round; dorso-lateral processes like a pointed right angle, anterior genital chamber small "U" shaped, but narrowly rounded at base (Fig. 1); hypophysis of paramere curved, sickle shaped, moderately long, wide, flat,distally round but making a pointed tip apically at inner side; body relatively broad with short, sharply pointed fore process and less distinct; spine like third one posterior to hypophysis and just anterior to fore process; outer process quite prominant, long and distally round; (Fig. 2); theca without lateral process, long, fused with basal apparatus, unusually narrow at distal portion and with dorsal face swollen medially (Fig . 3, 4); conjunctiva very long as a dominant part of endosoma; reservoir reduced; vesica extremely short.

Material examined. Ankara (Çubuk), 15.5.1961, 2 males; Ankara (Gölbaşı), 19.5.1961, 2 males; Ankara, 24.5.1986; Adana (Pozantı), 1.6.1984, 1 female; K. Maraş (Andırın), 20.7.1984, 3 females.

Heterogaster urticae (Fabricius), 1775

Synonymy: Cimex urticae Fabricius, 1775; Lygaeus urticae Fabricius, 1794; Pachymerus urticae Le Peletier and Serville, 1825; Aphanus urticae Brullé, 1835; Phygadicus urticae Fieber, 1861.

General coloration black, light gray, and light yellow; body with stiff vertical hairs; head black with a medio-proximal yellow spot dorsally; 1st antennal segment black, proximal and distal parts yellowish gray, 2nd yellowish-gray distally yellow-brown, 3rd and 4th yellowish gray distally yellow-brown; rostrum black; hardly reaching to middle coxa, 1st segment not reaching to proximal margin of head; pronotum with a yellow lateral margin and proximally yellowish, distally black; scutellum black with distal corner whitish yellow; wings yellowish gray with longitudinal rows of dark brown punctures; clavus with black anal corner; corium with 3 black spots at cubital vein and one more on medio-distal margin; anal and distal corners black; membrane colourless with a brown spot proximally and 3 brownish bands between veins; body ventrally, black; coxae yellowish; orificia yellowish; femora black, but 1st segment distally whitish yellow, 2nd and 3rd distally and proximally whitish yellow; tibiae whitish yellow with 3 rings distally; 1st tarsal segment black, proximally whitish yellow, 2nd whitish yellow, 3rd black; 6.5-7 mm in lenght.

Male genitalia was examined before (Aysev and Şişli, 1976) but it is found that, figures and some additions should be given for discussion. Pygophore consisting this platelike projection

dorso-distally as in H. artemisiae; posterior openning of pygophore is different than those of the other species of Heterogaster as in Fig. 5, 6; dorso-lateral processes narrower and apical pointness directed to distal; hypophysis of paramere longer, roundly pointed, body comperatively small; outher process narrower third denticle like process quite prominant, like a fore process, only smaller (Fig. 7).

Material examined: Kayseri (Pınarbaşı), 3.6.1976, 1 male; Aydın (Sultanhisar), Aydın (Samsun Dağı), 2.7.1973, 1 female; 20.5.1970, 3 females; Manisa, 29.5.1970, 1 male; Samsun (Bafra), 4.6.1973, 1 male; Kütahya, 10.6.1975, 1 female; Muğla (Bodrum), 4.6.1973, 3 males; (Centrum), 5.6.1973, 2 females; İzmir (Bornova), 2.6.1972, 2 males, 1 female; Hatay (Akbez), 13.7.1984, 1 male, 2 females; Ankara, 5.7.1986, 3 males, 1 female.

Heterogaster cathariae (Geoffroy), 1785

Synonymy: Cimex cathariae Geoffroy, 1785; Cimex catariae 1789; Cimex naevius Gmelin, 1790; Heterogaster rufescens Herrich-Schaeffer, 1835; Phygas nepetae Fieber, 1837; Heterogaster nepetae Puton, 1875.

General coloration black, whitish-yellow and grayish-green; body with short and very fine hairs and densely punctated in black; head black with a yellow spot dorsally; antenna black, 1st, 2nd and 3rd segments proximally whitish yellow; rostrum black extending to 2nd coxa; pronotum distally black, proximally whitish yellow or greenish-gray and with black lateral margines; scutellum black with distal corner grayish or whitish yellow; wings grayish-green or whitish-yellow; corium with a black spot distally; membrane colourless with proximal part brown spotted; body ventrally black; femora black, distally whitish yellow; tibia black with a whitish yellow rings medially; 1st tarsal segment distally black proximally whitish-yellow, 2nd whitish yellow, 3rd black; 6.5-7.5 mm in lenght.

Pygophore slightly longer than broad, distally convex and consisting somewhat plate like, very lightly pigmented projection located dorso-distally; dorso-lateral processes pointed like a right angle; anterior genital opening small, "U" shaped, narrowly rounded at base (Fig. 9, 10); hypophysis of paramere comperatively long, sickle shaped, wide even at distal part, apically round but making a pointed tip at inner of it; outer process long and distally round; fore process unusually different shaped, quite prominant, narrowly pointed and roundly hollowed at upper face; denticle like another 3rd process located anterior to inner process at base of hypophysis; body cylindiric and narrow (Fig. 11, 12); theca withouth lateral process, fused with basal apparatus much longer than broad, unusually narrow at distal portion; conjunctiva long, ejaculatory reservoir and vesica reduced.

Material examined: Ankara (Bağlum), 1.6.1961, 2 females; Adana (Pozantı), 1.6.1984, 3 males, 2 females; İçel (Silifke), 29.5.1984, 2 males, 1 female; Gaziantep (Oğuzeli), 15.7.1985, 3 males; İzmir (Bornova); 2.6.1972, 2 males, 2 females.

Heterogaster affinis Herrich-Schaeffer, 1835

Synonymy: Phygas semicolor Fieber, 1837; Phygadicus semicolon Baerensprunf, 1860.

General coloration black, rust coloured, yellow-brown; body with very fine short hairs; head black with a medio-proximal yellow spot dorsally; antennae black, distal part of segments narrowly brownish; rostrum black; pronotum yellow-brown proximally; distally black, laterally margined in white, sometimes with 4 dark coloured bands; scutellum black with yellowish median distally; wings yellow-brown, exocorium yellowish, mesocorium distally bordered with black or brown, anal corner brownish-black, veins yellowish; membrane colourless with 2 brown spots proximally; body ventrally black; femora black, distal parts narrowly whitish yellow; tibiae black with 2 light yellowish rings, 1st tarsal segment proximally whitish-yellow distally black, 2nd whitish-yellow, 3rd black; 7-3.5 mm in lenght.

Pygophore prominantly convex at distal surface, plate like dorso-distal projection relatively narrow; lateral faces straight more than round; dorso-lateral process wide like a right angle and pointed; anterior genital chamber small, with lateral margines slightly convex and basally "U" shaped (Fig. 13); hypophysis of paramere flat, quite wide, curved, distally round but making a pointed tip at inner side; fore process unusually different, somewhat conicle shaped with upper face slightly hollowed; outer process distally rounded; body consisting denticle like third process at base of hypophysis anterior to fore process (Fig. 14); theca long, without process, extremly narrow distally, swollen dorso-medially; conjunctiva long; vesica and ejaculatory reservoir reduced as in the other species of Heterogaster (Fig. 15, 16).

Material examined: Ankara, 16.5.1961, 3 males, 1 female.

Platyplax Fieber 1860

Platyplax salviae Schilling, 1829

Synonymy: Heterogaster salviae Schilling, 1829; Heterogaster waltlii Kolenati, 1845; Paxhygadicus salviae Assman, 1854; Phygadicus waltlii, 1860; Heterogaster salviae Walker, 1872.

General coloration black and light yellow; head black, with a yellowish spot medio-proximally, frons with a yellowish-brown median; tylus yellow-brown; 1st antennal segment black distally yellowish, 2nd yellowish proximally black, distaly brownish, 3rd and 4th black; rostrum easily reaching beyond medial of prosternum; pronotum yellowish with brown punctures, two transversal black spots distally placed, lateral margines pale yellow and inpunctate; scutellum black, punctated, with 3 pointed yellow projections; wings yellowish-gray and punctated; corium with brown spot at distal margin, distal corner next to membrane bordered with brown; membrane colourless; sternum black; pleural coxae yellow margined; legs yellowish, femora and tibiae with black spots and rings; tarsi yellowish 3th segment distally black; ventral of abdomen proximally black, distally yellow, laterally brown; 6-6.5 mm in lenght.

Pygophore round, distally convex and slightly indented at medial; dorso-lateral process with concave margines, comparetively narrower, sharply pointed and curved inward; anterior genital opening comparetively wider (Fig. 17); hypophysis of paramere narrower than those of the other species of Heterogaster, moderately long, sickle shaped, narrowing to distal and pointed; outer process quite prominant and becoming wider to distal; fore process unusually different, long, flat, somewhat rectangular shaped, directed to proximal and distally curved inward like a hook, long edges also curved inward (Fig. 18); theca long, fused with basal apparatus, without lateral process, extremely narrow distally and swollen dorso-medially; conjunctiva very long; reservoir and vesica incomplate as in species of Heterogaster (Fig. 19).

Material examined: Antalya (Aksu), 16.4.1973, 1 female; İçel (Güzeloluk), 30.5.1984, 2 males; (Namrun), 1.6.1984, 1 male, 4 females; (Mut), 28.6.1984, 3 males, 2 females.

Platyplax inermis (Rambur), 1839

Synonymy: Pachymerus inermis Rambur; Platyplax salviae inermis, 1936.

General coloration black, yellowish and partly rust coloured; head black laterally bordered with light yellow and with a yellowish spot at medio-proximal part dorsally; antennae yellow-brown; 1st segment black distally yellow-brown, 2nd proximally black; pronotum pale yellow-brown with black punctures, besides distally punctuated in black; scutellum black with distal corner yellowish; wings pale gray-dirty yellow and punctured in black; veins of corium brownish black toward distal; membrane colourless; paratergites with brownish spots; legs yellow-brown with black spots 4.5-5 mm in lenght.

Genitalia of this species was examined before (Aysev and Şişli, 1976). But figures and redescriptions were given for discussion. Distal convexity of pygophore less than that of P. salviae, anterior genital opening also smaller (Fig. 20).

Hypophyses of the paramere moderately long, sickle shaped, narrowing to distal, and pointed at tip; outher process becoming wider to distal; fore process unusually different shaped like a flat and rectengular hook directed to proximal as in P. salviae (Fig. 21). Theca having same characters with H. salviae resembling to subfamily Heterogasterinae (Fig. 22).

Material examined: Balikesir (Sındırgı), 17.5.1971, 3 females; İzmir (Gümüldür), 9.4.1973, 1 female; Bursa (İznik), 26.6.1975, 1 male; Çanakkale (Gökçeada), 3.5.1975, 2 males; Adana (Ceyhan), 9.6.1984, 1 female; İçel (Güzeloluk), 30.5.1985, 2 males.

Conclusion

Two genera, Heterogaster and Platyplax differ from each other by concavity of the lateral margines of pygophore and distinctness of

the denticle on fore femora externally. Dorso-lateral process of pygophore and parameres seem to include diagnostic genital characters of the genus. Dorso-lateral processes are wide more or less right angle shaped in the genus Heterogaster; but narrow, with slightly arched margines and narrowly pointed in the genus Platyplax. Parameres are different in structure in these two genera. Hypophysis gradually narrowing to distal and apically pointed in the genus Platyplax while being slightly narrowing to distal and apically round but makes a pointed tip at inner side in the genus Heterogaster. Outer process becomes wider distally in the Platyplax, but proximal and distal parts have the same width in the Heterogaster. Fore process is unique shaped in the Platyplax as described, and also entirely different than those of the species in the Heterogaster. Simple dorso-lateral process; small, more or less "U" shaped, basally narrow anterior genital opening of the pygophore; existing of the third process of the paramere; strong sclerotization, very narrow distal portion, being without lateral process and fusing with the basal apparatus of the theca; very long conjunctiva; reduced vesica and reservoir are the principle diagnostic characters of the male genitalia in the subfamily Heterogasterinae. Some differences in the shape of pygophore especially distal surface, dorso-lateral process and genital openings; form of the inner processes and small, pointed, denticle like third process; shape of the narrowing of distal portion of the theca seem to include discrimitive species characters as shown in this work.

Özet

Türkiye Heterogasterinae (Heteroptera:Lygaeidae) türleri üzerinde sistematik çalışmalar

Bu çalışmada Heterogaster artemisiae Schl., H. urticae (F.), H. cathariae (Geoffr.), H. affinis H.-S., Platyplax salviae (Schl.) ve P. inermis (Rb.) türleri üzerinde çalışılarak, önemli taksonomik karakterler şekillerle verilmiştir.

Acknowledgements

I am indebted to Dr. M. Nihat Şişli; Professor and Head, Department of Zoology, Hacettepe University, Science Faculty, Ankara; for all the helps. Sincere thanks are also due to Dr. Niyazi Lodos, Professor and Head, Department of Entomology, Ege University, İzmir; and Dr. Feyzi Önder, Professor, Department of Entomology, Ege University, İzmir; for giving a chance to work on their collection.

References

Ashlock, P. D., 1957. An investigation of the taxonomic value of the phallus in the Lygaeidae (Hemiptera:Heteroptera). Ann. Ent. Soc. America, 50: 407-426.

Aysev, N. and N. Şişli, 1976. Contribution to the morphology of male genitalia of Lygaeidae (Hemiptera). Hacettepe Bull. Nat. Sci. and Engineering, 5: 48-61.

Chopra, N. P. and K. B. Rustagi, 1980. Identity of Artemidorus prescus Distant (Hemiptera: Lygaeidae:Heterogastrinae). Oriental Insects, 14 (4): 429-435.

Hoberlandt, L., 1955. Hemiptera IV: Terrestial Hemiptera of Turkey. Result of the Zoological Scientific Expedition of the National Museum in Praha to Turkey. Acta ent. Mus. natn. Pragae, Suppl. 3, 264 pp.

Lodos, N., F. Önder, E. Pehlivan ve R. Atalay, 1978. Ege ve Marmara Bölgesi'nin zararlı böcek faunasının tespiti üzerinde çalışmalar (Curculionidae, Scarabaeidae, "Coleoptera"; Pentatomidae, Lygaeidae, Miridae "Heteroptera"). Zirai Mücadele Ofset Baskı Tesisi, Ankara, 301 s.

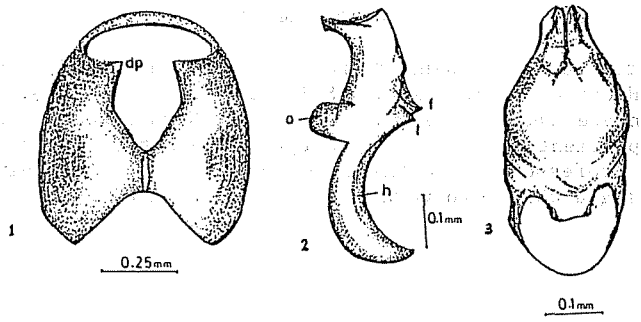
Scudder, G. G. E., 1962. New Heterogasterinae (Hemiptera) with a key to the genera of the World. Opuscula Entomologica, 27: 117-127.

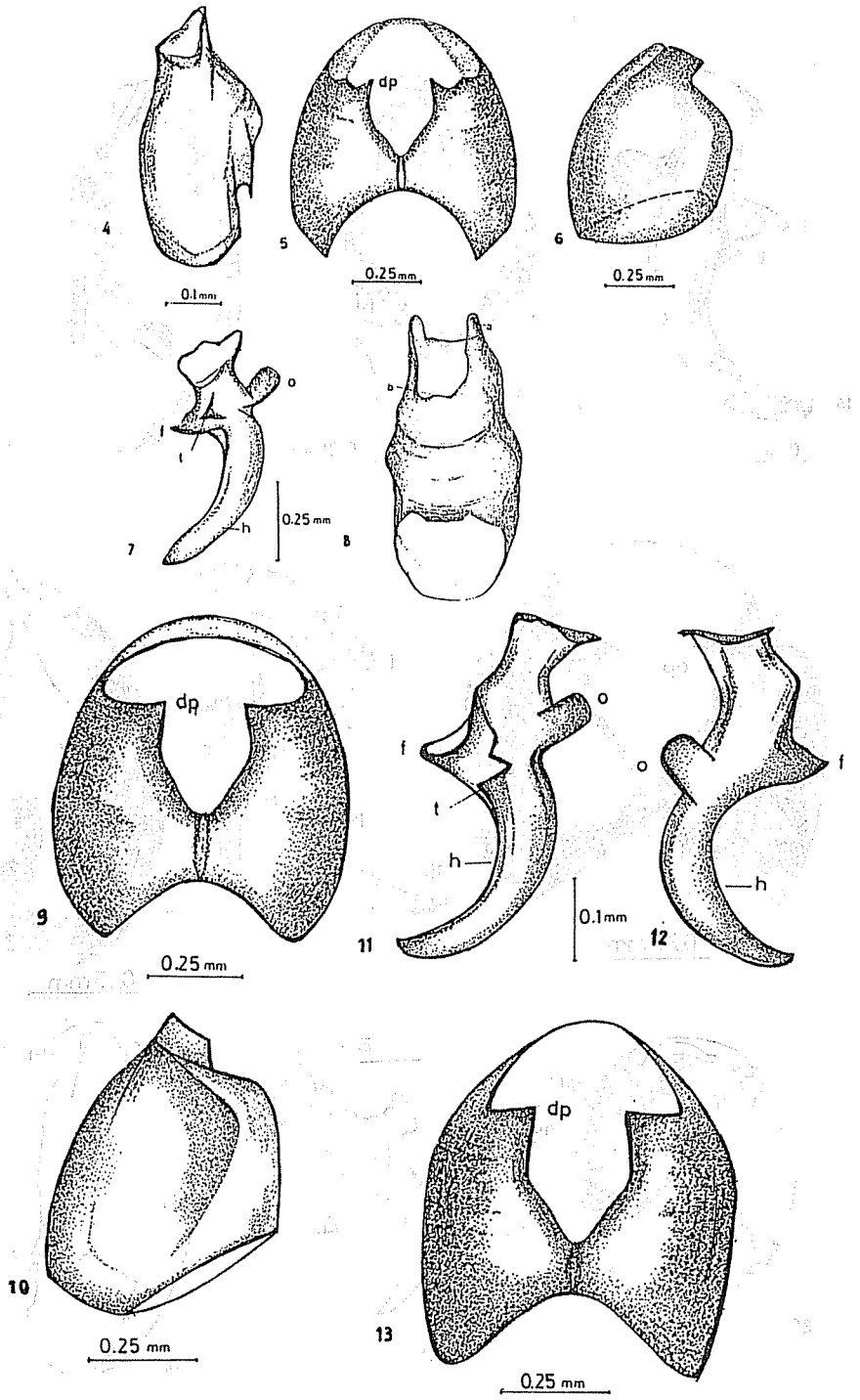
Tuatay, N., A. Kalkandelen ve N. Aysev, 1972. Nebat Koruma Müzesi Böcek Kataloğu (1961-1971). Yenigün Matbaası, Ankara, 119 s.

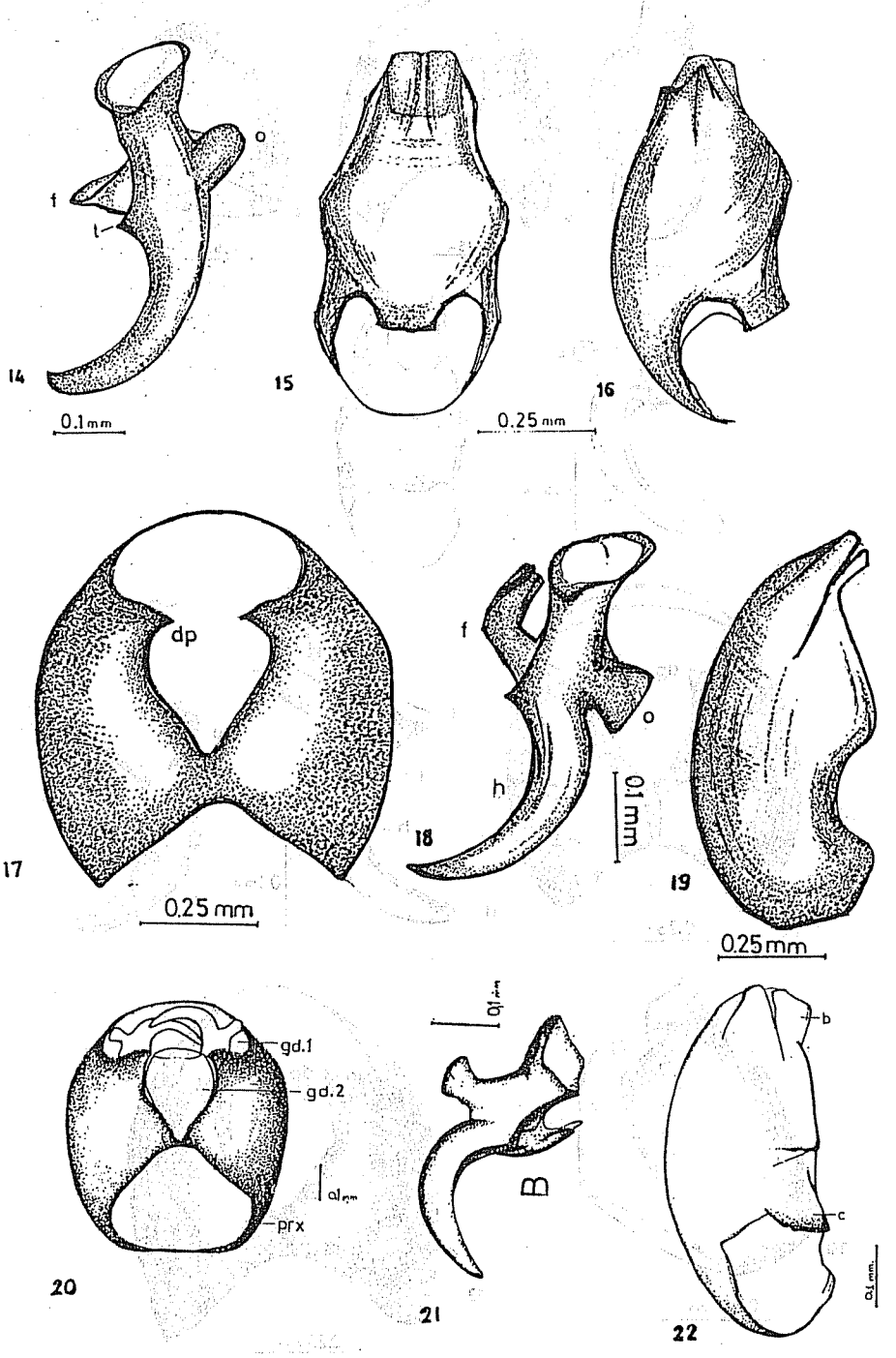
Illustration of Figures

Fig. 1-4: H. artemisiae (Schl.), 1- Pygophore (dorsal), 2- Paramere (lateral), 3- Theca (dorsal), 4- Phallotheca (latero-ventral), 5-8: H. urticae (F.), 5- Pygophore (dorsal), 6- Pygophore (lateral), 7- Paramere (lateral), 8- Phallotheca (dorsal), 9-12: H. cathariae (Geoffr.), 9- Pygophore (dorsal), 10- Pygophore (lateral), 11- Paramere (lateral), 12- Paramere. 13-16: H. affinis H.-S., 13- Pygophore (dorsal), 14- Paramere (lateral), 15- Phallotheca (dorsal), 16- Phallotheca (lateral). 17-19: P. salviae (Schl.), 17- Pygophore (dorsal), 18- Paramere (lateral), 19- Phallotheca (lateral). 20-22: P. inermis (Rb.), 20- Pygophore (dorsal), 21- Paramere (lateral), 22- Phallotheca (latero-dorsal). (Figs. 20, 21, 22 from Aysev and Şişli, 1976).

Abbreviations: dp- dorso-lateral process, h- hypophysis, o- outer process, f- fore process, t- third process.




4
0.1mm
5
dp
0.25mm
6
0.25mm
7
o
f
t
h
0.25 mm
8
b
9
dp
0.25 mm
11
o
f
t
h
0.1mm
12
o
f
h
10
0.25 mm
13
dp
0.25 mm


o
f
t
14
0.1 mm
15
0.25 mm
16
dp
17
0.25 mm
f
o
h
18
0.1 mm
19
0.25 mm
gd.1
gd.2
prx
20
B
21
b
c
22