

A REVIEW OF THE GENUS *NEPHASPI* CASEY
AND A COMPARISON WITH THE GENUS
CLITOSTETHUS WEISE
(COLEOPTERA : COCCINELLIDAE)

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An attempt to name specimens of a species of *Nephaspis* from Brazil led to this review. The material was submitted by Mrs. Eneide Carvalho Arruda who is working on the biology of this species. It was observed that members of *Nephaspis* bear a striking resemblance to members of the genus *Clitostethus*, the type of which is an Old World species. All species of *Nephaspis* are restricted to the Western Hemisphere even though Sicard (1929) described a species from British Guiana as *Clitostethus dispar*. Specimens of the type species of *Clitostethus* (*arcuatus* Rossi) have been dissected and compared with specimens of *Nephaspis* as discussed below and it is apparent that they represent 2 distinct genera. *Clitostethus dispar* must be placed in *Nephaspis* and the name *Clitostethus* removed from lists of Western Hemisphere Coccinellidae.

Mrs. Arruda's study should be of interest as nothing is presently known of the biology of the species of *Nephaspis* except that they are apparently restricted to feeding on members of the family *Aleurodidae*.

Nephaspis has been placed in the Scymnini by authors and this placement appears to be correct. It is a highly distinctive genus because of the tumid venter, short prosternum and postero-ventrally directed head. The short, compressed antenna (fig. 3) is also characteristic of the genus. I am indebted to R. D. Pope, British Museum of Natural History, for loan of the type series of *Clitostethus dispar*; to Mme. Bons for loan of the types of *dispar* in the Sicard collection. Paris Museum; and to Arthur Cushman who prepared the habitus views presented herein.

Genus *Nephaspis* Casey

Nephaspis Casey, 1899, p. 168. — Casey, 1905, p. 161. — Wingo, 1952, p. 44.

Type species: *Nephaspis gorhami* Casey, by present designation.

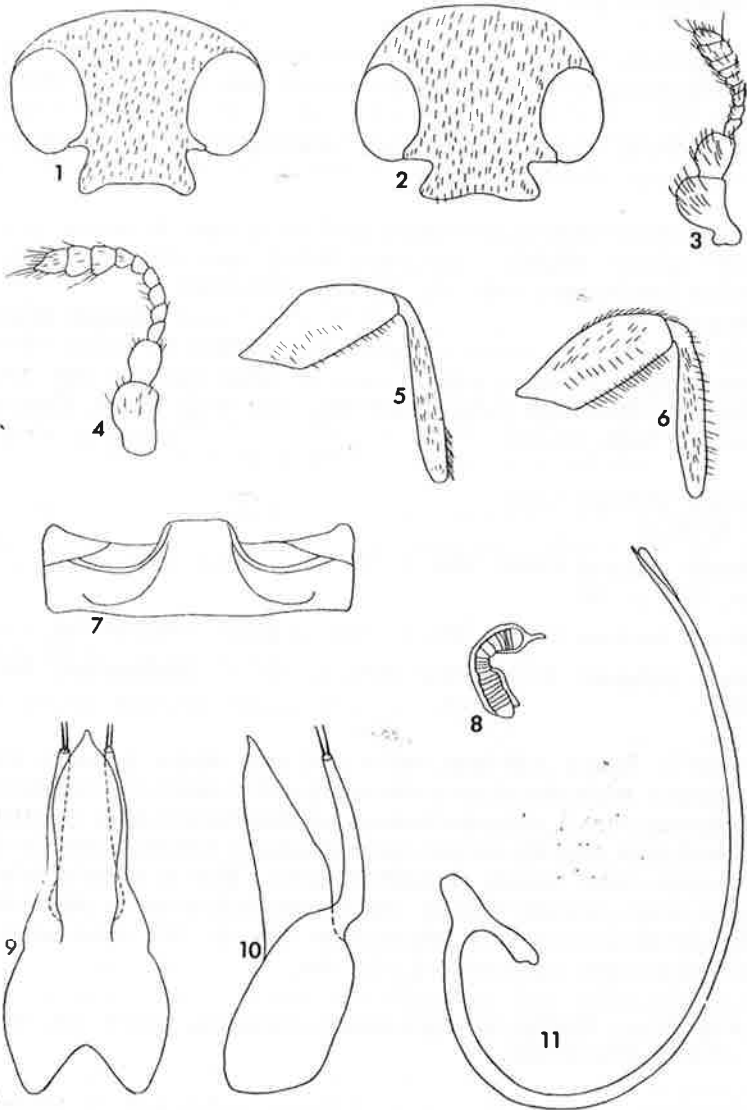
Nephasis: Korschefsky, 1931, p. 168. — Blackwelder, 1945, p. 445. (Error).

Form elongate, somewhat oval, head with mouthparts directed posterolaterally in repose, concealing prosternum. Head with clypeus extending well beyond eye, antero-lateral angle produced, rounded, anterior margin truncate, lateral margin emarginate at antennal insertion (fig. 1); gena partially dividing eye; 11-segmented antenna compact, short, not extending to hind angle of pronotum, first 2 segments enlarged, last 6 segments wider than long, club 3-segmented, basal segment strongly enlarged (fig. 3). Pronotum widest at postero-lateral angle, narrowed apically, anterior margin arcuately emarginate, posterior margin strongly rounded, produced medially. Presternum short, only slightly longer than anterior coxa, intercoxal process narrow medially, apex truncate, narrowly separating coxae. Mesosternum short, not as long medially as mesocoxa, coxae separated by the width of a coxa. Metasternum tumid. Pro- and mesofemora slender, not enlarged; metafemora enlarged medially, anterior margin convex (fig. 5): all tibiae slender; tarsus cryptotetræmerous, claw simple, unmodified. Abdomen with 6 visible sterna (6th sternum occasionally concealed beneath 5th); postcoxal line of the *Scymnus*, s. str., type, outer end curved forward (fig. 7). Male genitalia simple, asymmetrical, basal lobe longer than paramere (figs. 9, 10). Female with heavily sclerotized spermatheca, apex with a pointed projection (fig. 8).

The type species of the genus *Clitostethus*, *C. arcuatus* (Rossi), agrees with the above description except in the following respects: head with anterior margin of clypeus feebly emarginate, lateral projection of gena broad (fig. 2); antenna long, extending to postero-lateral angle of pronotum, all segments except apical 3 longer than wide, basal segment not strongly widened (fig. 4); meta-femur not enlarged, meta-tibia with coarse, long setae, particularly near outer margin (fig. 6); tarsus trimerous.

Clitostethus dispar Sicard is herein transferred to *Nephaspis* and a new species of *Nephaspis* is described, which, along with the 2 previously described species makes a total of 4 known members of the genus.

The sexes can usually be distinguished externally in *Nephaspis* (except *cocois*, n. sp.) as the male has the pronotum entirely yellow and the female has the pronotum entirely dark or at least with some sort of dark marking.



Key to males of *Nephaspis*

1. Male genitalia with basal lobe wide in lateral view, about one-half as wide as long (fig. 16), siphon with apex blunt (fig. 17); known only from British Guiana *dispar* (Sicard), n. comb.
Male genitalia with basal lobe less than one-half as long as wide siphon more or less pointed ?
2. Male genitalia with basal lobe widest near base in lateral view, tapering evenly to an apical point; known only from Pernambuco, Brazil *cocois*, n. sp.
Male genitalia with basal lobe not tapering evenly to apex; not known from Brazil 3
3. Male genitalia with upper margin straight to apex in lateral view lower margin slightly emarginate before apex (fig. 10), siphon straight before apex (fig. 11); known only from
Panama *gorhami* Casey
Male genitalia with upper margin feebly sinuate in lateral view, lower margin curved to pointed apex in apical one-half (fig. 13), siphon bent downward before apex (fig. 14); West Indies, Central America, Iowa, Florida *annicola* Wingo

Nephaspis gorhami Casey
Figs. 9, 10, 11

Nephaspis gorhami Casey, 1899, p. 168. — Casey, 1905, p. 161. — Wingo, 1952, p. 44.

Nephaspis brunnea Casey, 1899, p. 168. — Casey, 1905, p. 161.

Nephaspis gorhami: Korschefsky, 1931, p. 168. — Blackwelder, 1945, p. 445.

Male — Length 1.40 mm, width 0.97 mm. Color yellow; elytron piceous with discal area obscurely paler, meso- and metasternum piceous; first 3 abdominal sterna reddish brown. Male genitalia with basal lobe slightly longer than paramere, sinuate laterally in ventral view, upper margin straight from near base to apex in lateral view, lower margin slightly emarginate before apex; paramere feebly curved downward in lateral view (figs. 9, 10); siphon curved from base to apex, apex pointed (fig. 11).

Female. — Similar to male except pronotum, vertex of head and elytron unicolorous.

Variation. — Length 1.30 to 1.50 mm, width 0.85 to 1.05 mm

Type locality — Colombia (Panama).

Type depository. — of **gorhami**, USNM (lectotype here designated); of **brunnea**, USNM.

The male specimen in the Casey collection, USNM, bearing the labels "Colom", "Type USNM 35251", "*Nephaspis gorhami* Csy." is here designated as lectotype of **gorhami** and the 2 specimens with identical data, matching Casey's description, and bearing a red "gorhami Paratype 35251" label are here designated as paralectotypes. A third specimen also bears a red paratype label and a "Colom" label but fits the description of **brunnea** rather than **gorhami**, **brunnea** being the female of **gorhami**.

This specimen is not designated as a paralectotype. A single specimen bearing the label "Colom", "Type USNM 35252", "*brunnea* Csy." in the Casey collection, USNM, is here considered to be the holotype of **brunnea** Casey, which is simply the female of **gorhami** as pointed out by Casey (1905).

This species is close to **annicola** Wingo but the genitalic characters seem sufficient to separate them. If they could prove to be conspecific, **gorhami** would, of course, have priority.

Specimens examined. — Total 17. The type series and 12 specimens without data in the Casey collection, presumably also from Panama.

Nephaspis annicola Wingo.

Figs. 12, 13, 14, 21, 22, 23.

Nephaspis annicola Wingo, 1952, p. 44.

Male. — Length 1.35 mm., width 0.81 mm. Color yellow; elytron piceous to black along base and lateral margin, central area yellowish brown apex narrowly yellow (fig. 22); meso and metasternum piceous to black; abdomen with first three sterna reddish brown. Male genitalia with basal lobe distinctly longer than paramere, in lateral view upper margin broadly sinuate, lower margin gradually curved from near base to pointed apex, in ventral view basal lobe slender, evenly rounded from base to pointed apex; paramere feebly curved downward in lateral view (figs. 12, 13); siphon curved from base nearly to apex, bent downward before pointed apex (fig. 14).

Female. — Similar to male except pronotum and vertex of head piceous or black.

Variation. — Length 1.19 to 1.48 mm., width 0.79 to 1.00 mm. The elytron in the male varies from completely black (except apical yellow area) to black or piceous with a red or yellow discal spot (figs. 21, 23). The discal spot may be small and round or elongate, resembling a median vitta, or as described under male above.

Type locality. — Iowa: Boone, Ledges State Park.

Type depository. — USNM.

This apparently an extremely widespread species (see specimens examined below) and it may be that it has been distributed by commerce. It feeds on species of Aleurodidae and could have been carried with the whitefly on plant specimens from place to place. Specimens from all localities have identical male genitalia and exhibit the same elytral color variation. This is the only species of **Nephaspis** thus far known to occur north of Panama.

Dr. Wingo of the University of Missouri has deposited the types of **annicola** in the USNM collection.

Specimens examined. — Total 52. Lesser Antilles: Barbados, III-1966, XII-1964, III-1969, F. D. Bennett; Curaçao, V-1964, F. D. Bennett, with Aleurod. on Cocos. Dominica, 800' in forest 15-VI-41, R. G. Fennah; St. Lucia, Castries Apr. 29, 1941, on Hibiscus, R. G. Fennah; St. Martins, May, 1954. F. J. Simmonds; St. Vincent, X-1962 F. D. Bennett; Trinidad, 1960. Costa Rica: Limon, XI-59, N. H. L. Krauss. Honduras: La Ceiba, VII-27-1916, X-22-1916, F. J. Dyer. Panama: Canal Zone, Gatun, 7-IV-1911, A. H. Jennings; Paraiso, Apr. 2, 1911 (feeding on "Aleyrodes"), Apr. 17, 1911, Apr. 16, 1911, March 20, 1911, E. A. Schwarz, August Busck; Porto Bello, 18-2-1911, E. A. Schwarz. United States: Florida, Dade City, Nov. 13, 1951, K. Townsend; Plant City, Nov. 21, 1951, K. Townsend; Vero, 3 mi W., Nov. 21, 1951, Holtsberg; Orlando, 7-30-25, feeding on Whitefly Ia; Iowa, Boone, Ledges State Park, IX-16-49, VII-4-50, IX-29-50, C. W. Wingo, Jean Laffoon (type series). BMNH (USNM).

Nephaspis dispar (Sicard), n. comb.
Figs. 15, 16, 17.

Scymnus (Clitostethus) dispar Sicard, 1929, pp. 520-521.

Clitostethus dispar: Korschefsky, 1931, p. 114. — Blackwelder, 1945, p. 444.

Male. — Length 1.49 mm., width 1.05 mm. Color yellow; elytron reddish brown with lateral margin obscurely darker, apex narrowly yellow; metasternum reddish brown. Male genitalia with basal lobe distinctly longer than paramere, extremely wide in lateral view, about one-half as wide as long, upper margin feebly sinuate, abruptly descending to pointed apex (figs. 15, 16); siphon straight in apical one-third, apex bluntly rounded (fig. 17).

Type depository. — British Museum (Nat. Hist.), lectotype here designated.

Variation. — Length 1.40 to 1.49 mm., width 0.95 to 1.05 mm.

Type locality. — British Guiana: Georgetown.

Type depository. — British Museum (Nat. Hist.), lectotype here designated.

This species has very distinctive male genitalia and it also appears to be somewhat larger in size than most of the other species of *Nephaspis*. As indicated by the collection data of the type series, this species feeds on whitefly. A male specimen in the British Museum bearing the following labels is here designated as lectotype: "Syntype" "Brit. Guiana, Georgetown, V-1926, L. D. Cleare, Jr."; "predaceous on Aleurodid on *Triplaris surinamensis*". Three specimens in the Sicard collection, Paris Museum, and an additional 21 specimens in the British Museum all with the same data as the lectotype and labeled as "Types" or "Syntypes", are here designated paralectotypes.

***Nephaspis cocois*, n. sp.**

Figs. 18, 19, 20.

Male. — Length 1.55 mm., width 1.10 mm. Color yellow; elytron piceous; apex narrowly yellow, meso- and metasternum and first 2 abdominal sterna reddish brown to piceous. Head pubescent, punctured, punctures fine, separated by 2 to 3 times their diameter. Pronotum pubescent, punctured, punctures fine, separated by 1 to

3 times a diameter. Elytron pubescent, punctured, punctures coarse, evenly distributed, separated by the diameter of a puncture. Ventral surface from mesosternum to apex of abdomen pubescent, punctures coarse, dense and nearly contiguous laterally, separated by 1 to 4 times their diameter medially. Genitalia with basal lobe distinctly longer than paramere, in lateral view widened in basal one-third, tapered to pointed apex in apical two-thirds, in ventral view lateral margin evenly rounded from base to pointed apex (figs. 18, 19); siphon rounded from base to apex, lower margin slightly constricted before apex, apex pointed (fig. 20).

Female. — Similar to male in all respects.

Variation. — Length 1.45 to 1.57 mm., width 0.90 to 1.15 mm. The elytral color pattern in the type series varies from that described above to a form in which the discal area is reddish brown, and to a form in which the entire elytron is yellowish brown except for the narrow, apical yellow area.

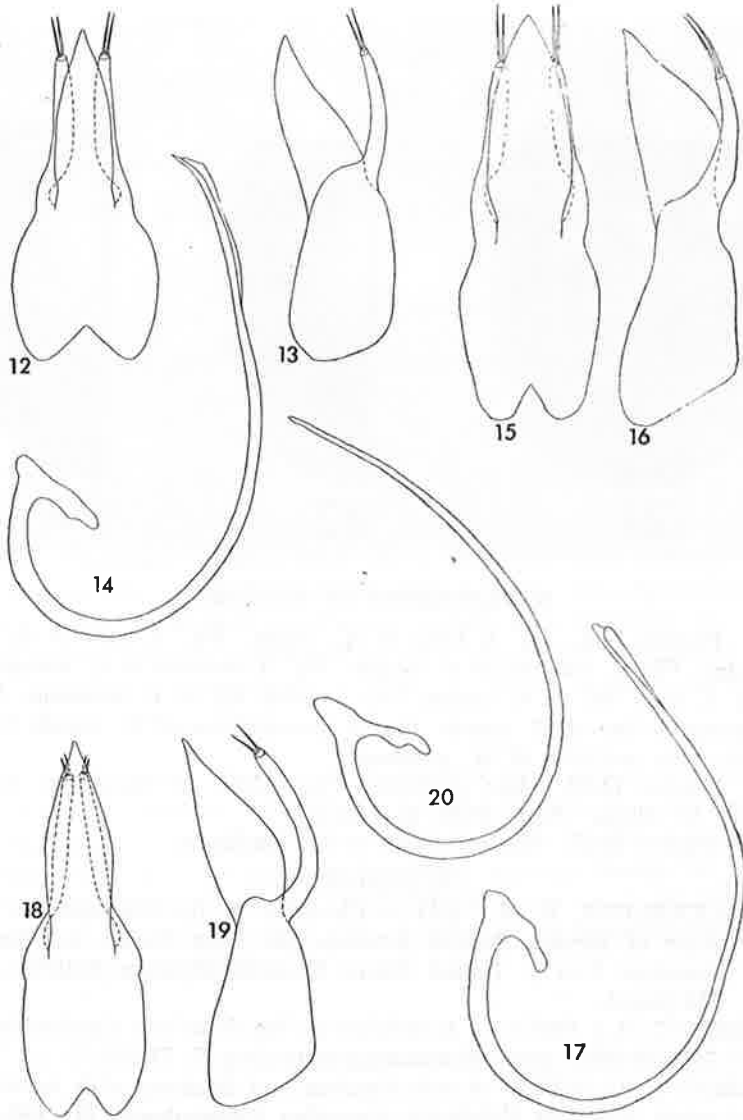
Holotype. — Male. Brazil: Pernambuco, Recife, October, 1970,

M. B. Carvalho, on *Anacardium occidentale* feeding on *Aleuroricus cocois* (Museu de Zoologia, USP).

Paratypes. — Total 74. Brazil: same data as holotype; Recife, Pern., 1963, XI-1964, with Aleur. on cashew. (BMNH) (USNM) (E. C. Arruda). (Museu de Zoologia, USP) (Departamento de Entomologia, ESALQ, USP, Piracicaba).

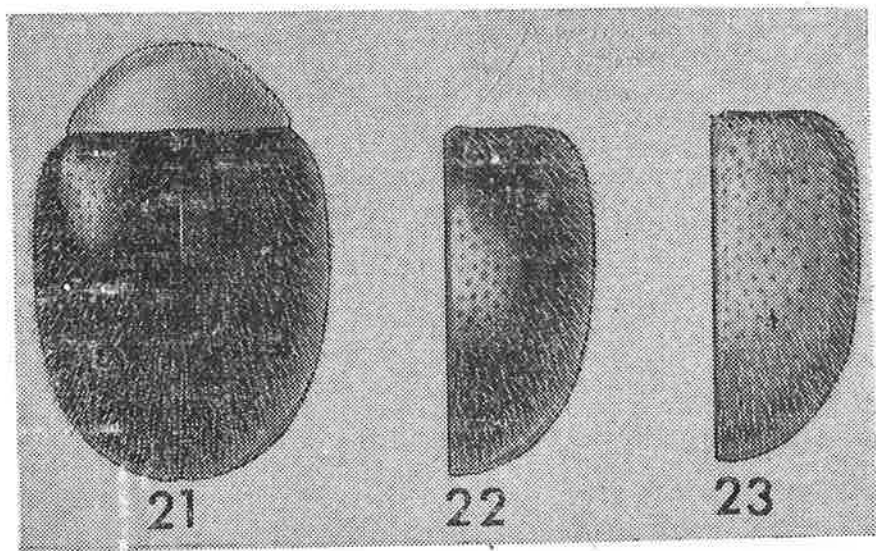
This is the only species of *Nephaspis* thus far known from Brazil. The host is the cashew whitefly, *Aleurodicus cocois* (Curtis), and the biology is being studied by Mrs. Eneide Carvalho Arruda of the Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, Estado de São Paulo, Brazil.

In the other species of *Nephaspis* males and females can be distinguished from each other by the color of the head and pronotum, but there are no color differences between the sexes in *N. cocois*. Externally males of *N. cocois* are difficult to distinguish from males of other species of *Nephaspis*, but the females can be distinguished by the entirely yellow pronotum.



ABSTRACT

The Western Hemisphere genus *Nephaspis* Casey is reviewed, a new species (*Nephaspis cocois*) is described, and a comparison is made with the Old World genus *Clitostethus* Weise.



EXPLANATION OF FIGURES

Figures 1-11. Fig. 1, head of *N. cocois*. Fig. 2, head of *C. arcuatus*. Fig. 3, antenna of *N. cocois*. Fig. 4, antenna of *C. arcuatus*. Fig. 5, hind leg of *N. cocois*. Fig. 6, hind leg of *C. arcuatus*. Fig. 7 postcoxal line of *N. cocois*. Fig. 8, spermatheca of *N. cocois*. Figs. 9-11, male genitalia of *N. gorhami*.

Figures 12-20. Male genitalia. Figs. 12-14, *N. amnicola*. Figs. 15-17, *N. dispar*. Figs. 18-20, *N. cocois*.

Figures 21-23. Habitus views of *N. amnicola*.

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