

## NEW DESCRIPTIONS

### ON SOME NEW SPECIES OF *TETRASTICHUS* HALIDAY (HYMENOPTERA: EULOPHIDAE)<sup>1</sup>

M. YOUNUS KHAN AND S. ADAM SHAFEE<sup>2</sup>

(With three text-figures)

#### *Tetrastichus indicus* sp. nov. (Fig. 1, A-L)

##### Female

HEAD (Fig. 1 A).—Dark brown, wider than long in facial view (0.39:0.28 mm); frontovertex much wider, more than one-half the total head width; ocelli white, arranged in obtuse triangle, lateral ocelli more than their own diameters from orbital margin and less than their own diameters from occipital margin; eyes red and smooth; antennae inserted at lower level of eyes; prominence between antennal sockets one-third the width of frons between eyes; malar space longer than eye width; malar sutures distinct; lower margin of clypeus without dents medially; mandibles tridentate with apical tooth acute, mesal rounded and lower rudimentary (fig. 1 B); maxillary and labial palpi each 1-segmented (fig. 1 D).

ANTENNAE (Fig. 1 C).—Yellowish brown, 8-segmented excluding one ring segment; scape cylindrical, four times as long as wide (0.12:0.03 mm), longer than basal two funicle segments together; pedicel twice as long as wide, slightly longer than first funicle segment; funicle 3-segmented, segments 1-3 gradually decreasing in length distad; first funicle segment one and a half times as long as wide, second slightly longer than wide, third as long as

wide; club 3-segmented, slightly more than two times as long as wide, longer than preceding two funicle segments together.

THORAX (Fig. 1 E).—Dark brown; pronotum with posterior margin slightly concave and with 4 pairs of setae, anterior margin concave in middle (fig. 1 G); parapsidal furrows complete; scutum with a mid-longitudinal groove and 3 setae in single row near each parapsidal furrow; scutellum slightly shorter than scutum with two submedian grooves and two pairs of setae, posterior margin rounded; each parapside with single seta; mesopostphragma not reaching beyond the propodeum; propodeum with a well developed median carina.

FORE WINGS (Fig. 1 F).—Hyaline, slightly less than two and a half times as long as wide, apex broadly rounded; costal cell as long as marginal vein and with 2 small setae; submarginal and marginal veins with 1 and 8 setae respectively; postmarginal vein absent; marginal fringe short, spaced by a distance equal to one-fourth their length.

HIND WINGS.—Hyaline, six times as long as wide (0.74:0.12 mm); marginal fringe long, one-half the wing width, spaced by a distance equal to one-sixth their length.

LEGS.—Yellow except coxae and pretarsus which are brownish; tarsi 4-segmented; pretarsus longer than tarsal segments 1-3 separately; middle tibial spur shorter than basitarsus.

ABDOMEN (Fig. 1 H).—Yellow except late-

<sup>1</sup> Accepted July 1980.

<sup>2</sup> Section of Entomology, Department of Zoology, Aligarh Muslim University, Aligarh, India.



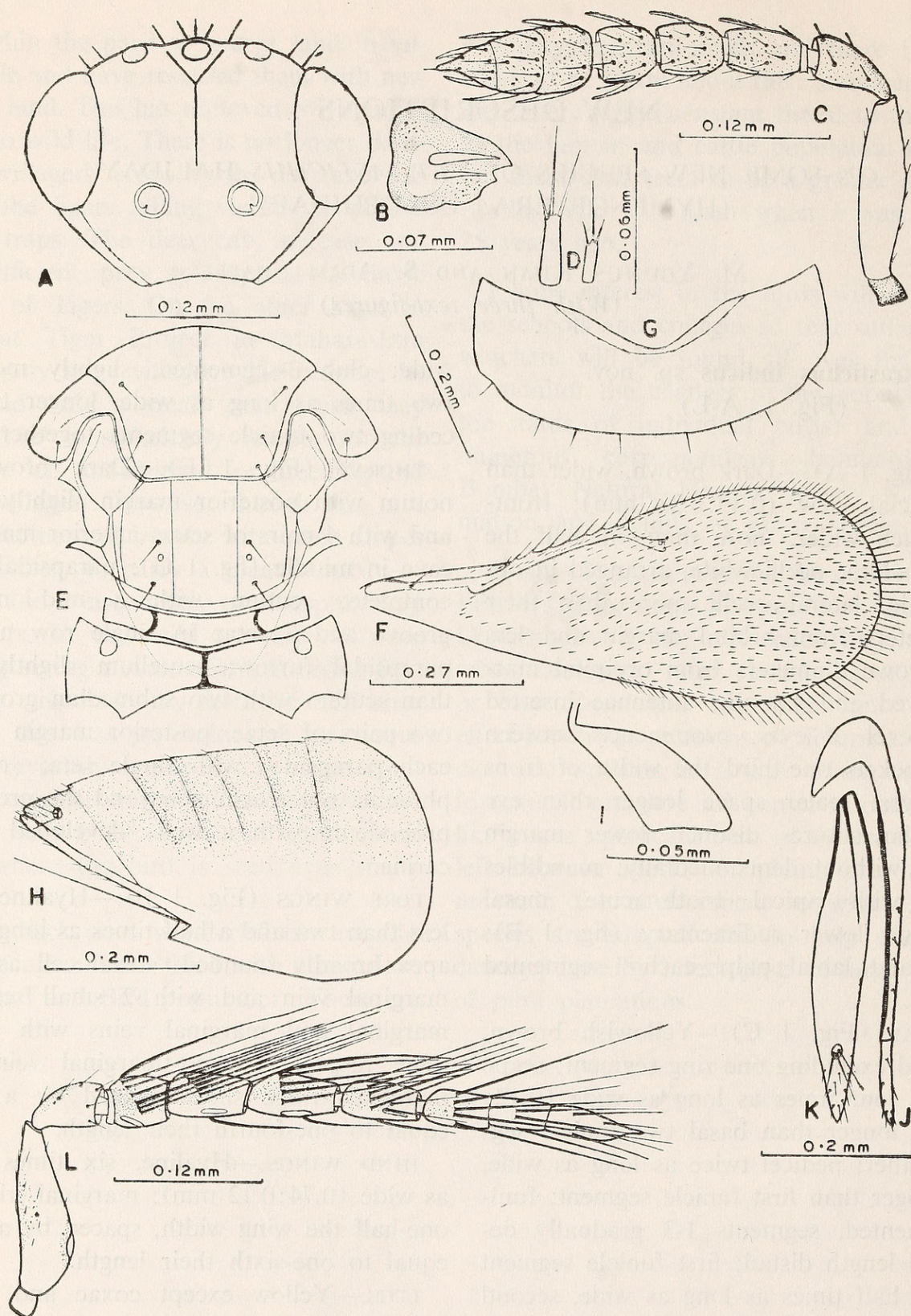


Fig. 1. A-L. *Tetrastichus indicus* sp. nov., ♀, ♂: (A) Head, in facial view, ♀; (B) Mandible, ♀; (C) Antenna, ♀; (D) Maxillary and labial palpi, ♀; (E) Propodeum and part of thorax in dorsal view, ♀; (F) Fore wing, ♀; (G) Pronotum, ♀; (H) Abdomen in lateral view, ♀; (I) First valvifer, ♀; (J) Second valvifer and third valvula, ♀; (K) Outer plate of ovipositor, ♀; (L) Antenna, ♂.



ral and apical portions of dorsum which are dark brown, as long as head and thorax together (0.56:0.56 mm); ovipositor concealed, arising from base of abdominal venter; first valvifers triangular with basal and apical angles at different levels (fig. 1 I); second valvifers long, more or less of uniform width, third valvulae movably articulated with second valvifers (fig. 1 J); outer plates of ovipositor shorter than the length of second valvifers and third valvulae together, narrow at apex (fig. 1 K).

Female length: 1.13 mm.

Male antennae as shown in (fig. 1 L).

*Holotype* ♀, INDIA: Tamil Nadu, Madurai, ex Mealy bugs on *Cassia* sp., 9.iii.1975 (M. Younus Khan).

*Paratypes*. 5 ♀, 3 ♂ (Same data as holotype).

***Tetrastichus aligarhensis* sp. nov.**  
(Fig. 2, A-J)

**Female**

Resembles *T. indicus* except in the following characters:

**HEAD.**—Dark with metallic reflections; eyes reddish brown; prominence between antennal sockets one-fourth the width of frons between eyes; malar space about as long as eye width; lower margin of clypeus with two dents medially.

**ANTENNAE** (Fig. 2 B).—Brown except scape which is yellow; scape three and a half times as long as wide, as long as funicle; pedicel less than twice as long as wide, distinctly longer than first funicle segment; first funicle segment slightly longer than wide, second and third as long as wide; club slightly more than twice as long as wide.

**THORAX.**—Dark with metallic reflections; pronotum with posterior submarginal ridge bearing 4 pairs of setae, antero-lateral angles obtuse and laterally directed (fig. 2 C); scu-

tum slightly longer than wide and with 7 setae near each parapsidal furrow; each parapside with 6 setae; scutellum more than one-half the length of scutum.

**FORE WINGS.**—Slightly more than twice as long as wide (0.93:0.44 mm); costal cell with 7 setae; submarginal and marginal veins with 2 and 9 setae respectively (fig. 2 E); disc with a line of setae running beneath the cubital hair line.

**LEGS.**—Yellow except coxae which are dark with metallic reflections.

**ABDOMEN.**—Dark with metallic reflections; ovipositor arising from apical one-third of abdominal venter; third valvulae short, triangular, less than twice as long as wide, about one-fifth the length of second valvifers (fig. 2 G); outer plates of ovipositor slightly longer than second valvifers and third valvulae together (fig. 2 H); subgenital plate more or less of uniform width, posterior margin with a notch in middle (fig. 2 I).

Female length: 1.13 mm.

Male antennae as shown in (fig. 2 J).

*Holotype* ♀, INDIA: Uttar Pradesh, Aligarh University Agricultural Farm, ex *Pulvinaria* sp. on *Azadirachta indica*, 10.v.1977 (M. Younus Khan).

*Paratypes*. 2 ♀, 1 ♂ (same data as holotype).

***Tetrastichus ajmerensis* sp. nov.**  
(Fig. 2, K-S)

**Female**

Resembles *T. indicus* except in the following characters:

**HEAD.**—Eyes silvery white; prominence between antennal sockets one-sixth the width of frons between eyes; lower margin of clypeus with two dents medially.

**ANTENNAE** (Fig. 2 K).—Yellowish; scape three and a half times as long as wide (0.1: 0.03 mm); pedicel one and a half times as long



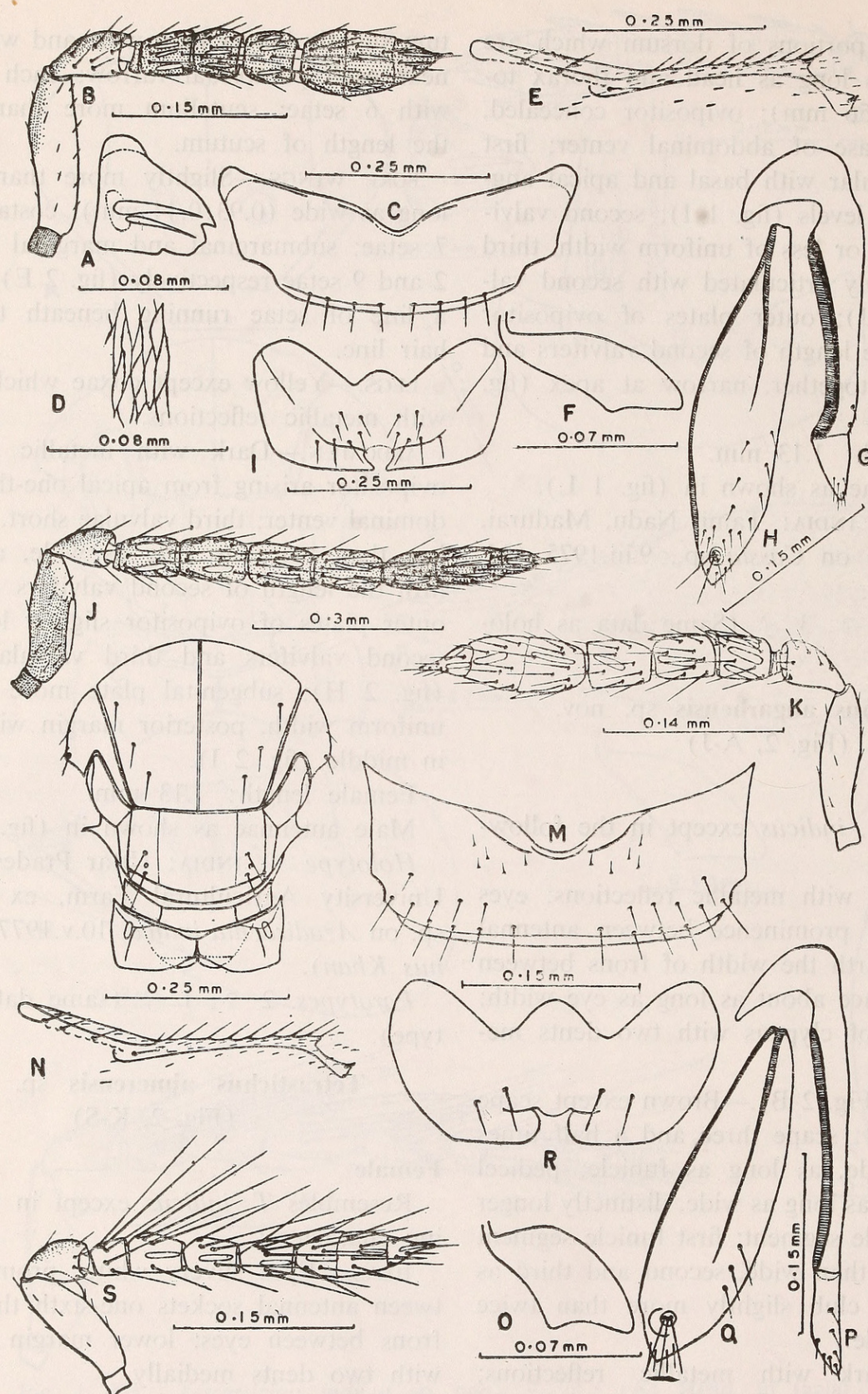


Fig. 2. A-J. *Tetrastichus aligarhensis* sp. nov., ♀, ♂: (A) Mandible, ♀; (B) Antenna, ♀; (C) Pronotum, ♀; (D) Sculpture of scutum, ♀; (E) Fore wing venation, ♀; (F) First valvifer, ♀; (G) Second valvifer and third valvula, ♀; (H) Outer plate of ovipositor, ♀; (I) Subgenital plate, ♀; (J) Antenna, ♂.

K-S. *Tetrastichus ajmorensis* sp. nov., ♀, ♂: (K) Antenna, ♀; (L) Propodeum and part of thorax in dorsal view, ♀; (M) Pronotum, ♀; (N) Fore wing venation, ♀; (O) First valvifer, ♀; (P) Second valvifer and third valvula, ♀; (Q) Outer plate of ovipositor, ♀; (R) Subgenital plate, ♀; (S) Antenna, ♂.



as wide; two ring segments distinct; funicle segments 1-3 slightly longer than wide, first shorter than second and third separately; club three times as long as wide (0.12:04 mm).

THORAX (Fig. L).—Brownish; posterior margin of pronotum straight, posterior submarginal ridge distinct bearing 6 pairs of setae (fig. 2 M); scutellum about one-half the length of scutum; submedian grooves of scutellum widely separated.

FORE WINGS.—Costal cell slightly shorter than marginal vein and with 8 setae; submarginal and marginal veins with 3 and 8 setae respectively (fig. 2 N); marginal fringe spaced by a distance equal to one-fifth their length.

LEGS.—Yellowish except coxae and femora which are brown.

ABDOMEN.—Brownish except base which is yellow; third valvulae three and a half times as long as wide, one-third the length of second valvifers (fig. 2 P); outer plates of ovipositor slightly longer than second valvifers (fig. 2 Q); subgenital plate broad, posterior margin with a notch in middle (fig. 2 R).

Female length: 0.91 mm.

Male antennae as shown in (Fig. 2 S).

*Holotype* ♀, INDIA: Rajasthan, Jaipur, ex *Coccidohystrix insolitus* (Green) on *Solanum melongena* Linn., 28.ix.1975 (M. Younus Khan).

*Paratypes*. 23 ♀, 10 ♂ (Same data as holotype).

***Tetrastichus annulicornis* sp. nov.**

(Fig. 3, A-F)

#### Female

Resembles *T. indicus* except in the following characters:

HEAD.—Yellowish except dorsum which is brown; antennae inserted just above lower level of eyes; prominence between antennal sockets one-fifth the width of frons between eyes; eyes deep red; lower margin of clypeus with two dents medially.

ANTENNAE (Fig. 3 A).—Brownish except scape which is yellow; pedicel less than twice as long as wide, as long as first funicle segment; three ring segments distinct; first funicle segment one and a half times as long as wide, second and third slightly longer than wide.

THORAX.—Yellowish brown; scutum with 5 setae near each parapsidal furrow; scutellum slightly more than one-half the length of scutum.

FORE WINGS.—Twice as long as wide (0.74:0.37 mm); costal cell shorter than marginal vein and with 7 setae; submarginal and marginal veins with 4 and 10 setae respectively (fig. 3 B); disc with a line of setae running beneath the cubital hair line.

LEGS.—Yellow except fore coxae which are brown; middle tibial spur as long as basitarsus.

ABDOMEN.—Dark brown except basal one-third which is yellow; ovipositor arising from basal one-third of abdominal venter; first valvifers semicircular (fig. 3 C); third valvulae six times as long as wide, more than one-third the length of second valvifers (fig. 3 D); outer plates of ovipositor as long as second valvifers (fig. 3 E); subgenital plate broad, posterior margin with a notch in middle.

Female length: 1.07 mm.

Male antennae as shown in (fig. 3 F).

*Holotype* ♀, INDIA: Rajasthan, Jaipur, ex *Coccidohystrix insolitus* (Green) on *Achyranthus aspera*, 30.ix.1975 (M. Younus Khan).

*Paratypes*. 6 ♀, 6 ♂ (same data as holotype).

***Tetrastichus psyllidis* sp. nov.**

(Fig. 3, G-N)

#### Female

HEAD.—Completely yellow; eyes red with 6 dark patches; antennae inserted above lower level of eyes; mandibles with well developed teeth (fig. 3 G).



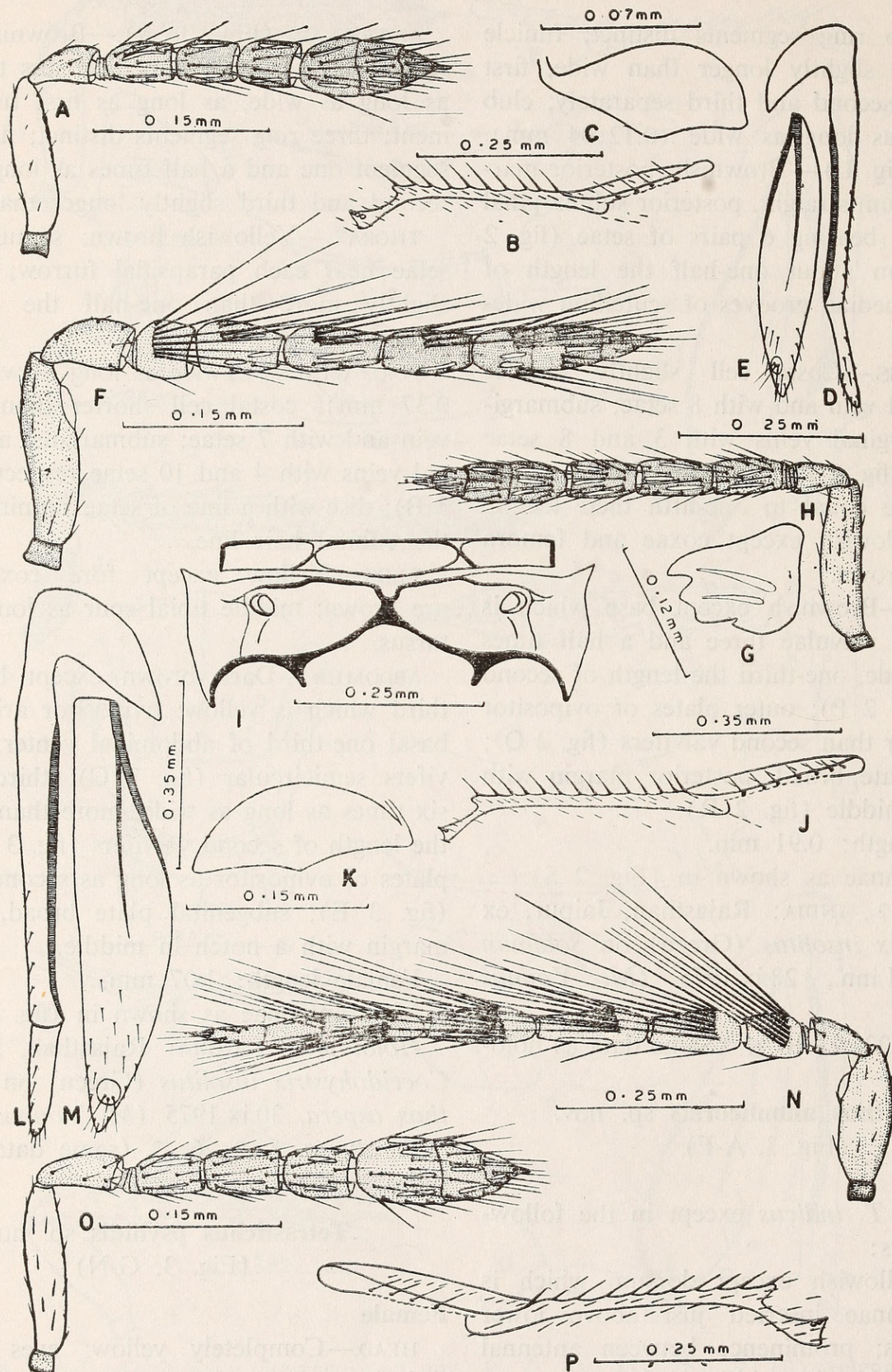


Fig. 3. A-F. *Tetrastichus annulicornis* sp. nov., ♀, ♂: (A) Antenna, ♀; (B) Fore wing venation, ♀; (C) First valvifer, ♀; (D) Second valvifer and third valvula, ♀; (E) Outer plate of ovipositor, ♀; (F) Antenna, ♂.  
 G-N. *Tetrastichus psyllidis* sp. nov., ♀, ♂: (G) Mandible, ♀; (H) Antenna, ♀; (I) Metanotum and propodeum, ♀; (J) Fore wing venation, ♀; (K) First valvifer, ♀; (L) Second valvifer and third valvula, ♀; (M) Outer plate of ovipositor, ♀; (N) Antenna, ♂.  
 O. & P. *Tetrastichus flavidus* sp. nov., ♀: (O) Antenna; (P) Fore wing venation.



**ANTENNAE** (fig. 3 H).—Scape slightly less than four times as long as wide (0.18:0.05 mm), as long as basal two funicle segments together; pedicel less than twice as long as wide, shorter than first funicle segment; three ring segments distinct; funicle segments 1-3 subequal in length, each twice as long as wide; club three and a half times as long as wide, as long as preceding two funicle segments together.

**THORAX**.—Completely yellow; posterior margin of pronotum with 7 pairs of setae; scutum with 8 setae near each parapsidal furrow; scutellum slightly more than one-half the length of scutum; propodeum very narrow in middle, posterior margin much sclerotized (fig. 3 I).

**FORE WINGS**.—Slightly less than two and a half times as long as wide (1.38:0.58 mm); costal cell shorter than marginal vein and with 7 small setae; submarginal and marginal veins with 7 and 14 setae respectively; postmarginal vein rudimentary (fig. 3 J); disc with a line of setae running beneath the cubital hair line.

**LEGS**.—Completely yellow; middle tibial spur as long as basitarsus.

**ABDOMEN**.—Completely yellow except apex of ovipositor infuscated; longer than head and thorax together (1.24:0.91 mm); ovipositor slightly exerted; first valvifers semicircular (fig. 3 K); third valvulae four times as long as wide, one-fourth the length of second valvifers (fig. 3 L); outer plates of ovipositor as long as second valvifers (fig. 3 M).

Female length: 2.15 mm.

Male antennae as shown in (fig. 3 N).

*Holotype* ♀, INDIA: Uttar Pradesh, Aligarh, Jawahar Park ex Psyllids in leaf galls of *Grevia asiatica* Linn., 2.ix.1975 (M. Younus Khan).

*Paratypes*. 3 ♀, 2♂ (same data as holotype).

***Tetrastichus flavidus* sp. nov.**

(Fig. 3, O & P)

**Female**

Resembles *T. indicus* sp. n. except in following characters:

**HEAD**.—Completely yellowish brown; antennae inserted just above lower level of eyes; prominence between antennal sockets about one-fourth the width of frons between eyes; eyes silvery white.

**ANTENNAE** (Fig. 3 O).—Yellowish brown except scape which is yellow; scape slightly more than four times as long as wide (0.13:0.03 mm.); three ring segments distinct; funicle segments 1-3 subequal in length, each one and a half times as long as wide.

**THORAX**.—Completely yellowish brown; scutum with 5 setae near each parapsidal furrow; scutellum more than one-half the length of scutum.

**FORE WINGS**.—More than twice as long as wide; costal cell shorter than marginal vein and with 11 setae; submarginal and marginal veins with 4 and 10 setae respectively; postmarginal vein slightly developed (fig. 3 P); disc with a line of setae running beneath the cubital hair line.

**ABDOMEN**.—Yellow except 5 transverse bands on dorsum which are brown; longer than head and thorax together (0.89:0.68 mm); ovipositor slightly exerted, arising from basal one-third of abdominal venter.

Female length: 1.57 mm.

*Holotype* ♀. INDIA: Andhra Pradesh, Guntur, ex Coccid on Weed plant, 3.viii.1976 (M. Younus Khan).

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