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Six new species of the genus *Pemphredon* LATREILLE (Hymenoptera, Sphecidae)

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Abstract: Six new species of digger wasps of the genus *Pemphredon* LATREILLE are described: *P. pulawskii* n. sp., *P. montanella* n. sp. and *P. fischeri* n. sp. from the U.S.A., *P. laotis* n. sp. and *P. gusenleitneri* n. sp. from Laos and *P. kashmirensis* n. sp. from India.

Key Words: Systematics, Hymenoptera, Sphecidae, *Pemphredon*.

Introduction

This paper is part of a worldwide revision of the genus *Pemphredon*, which I am working on. It will take some time until the revision is finished. Therefore I am publishing the new species which I have found so far. A key to all species of *Pemphredon* will be published later. I follow BOHART & MENKE (1976) in their usage of morphological terms.

Acknowledgements

This study was made possible by the material provided by cooperative managers of the following collections (abbreviations listed are used in the text):

AEIC American Entomological Institute, Gainesville, Florida, U.S.A. (Dr. D. Wahl)

AMNH American Museum of Natural History, Entomology Collection, New York, NY., U.S.A. (Dr. A. Sharkov)

- BMNH The Natural History Museum, Department of Entomology, London, England (Dr. C. R. Vardy)
- BPBM Bishop Museum, Department of Entomology Collection, Honolulu, Hawaii, U.S.A. (Keith Arakaki)
- CASC California Academy of Sciences, Department of Entomology, San Francisco, California, U.S.A. (Dr. W. J. Pulawski)
- CNCI Canadian National Collection of Insects, Biosystematic Research Institute, Agriculture Canada, Ottawa, Canada (J. Denis)
- DEUN University of Nebraska State Museum, Division of Entomology, Lincoln, Nebraska, U.S.A. (Dr. B. C. Ratcliffe)
- MCZC Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A. (St. P. Cover)
- MUIC Mississippi Entomological Museum, Mississippi State, Mississippi, U.S.A. (Dr. T. L. Schiefer)
- PMAE Provincial Museum of Alberta, Edmonton, Canada (Dr. A. T. Finnamore)
- UCDC The Bohart Museum, Department of Entomology, University of California, Davis, California U.S.A. (S. L. Heydon)
- UMMZ University of Michigan, Museum of Zoology, Division of Insects, Ann Arbor, Michigan, U.S.A. (Dr. M. O'Brien)
- USNM United States National Entomological Collection, U.S. National Museum of Natural History, Washington D.C., U.S.A. (Dr. A. S. Menke)

I thank my colleague Mag. G. Posset for her help with my English.

***Pemphredon pulawskii* DOLLFUSS n. sp.**

E t y m o l o g y : The name of the species is given in honor of Dr. Wojciech J. Pulawski, San Francisco, California.

D i a g n o s t i c C h a r a c t e r s : *Pemphredon pulawskii* and *laotis* n. sp. differ from other species by broad transverse ridges (fig. 1 and 2) on the scutum. *P. pulawskii* differs from *P. laotis* by strong and irregular rugae on the propodeal enclosure and no distinct pad surrounding it. In *laotis* propodeal enclosure with close longitudinal ridges and a shiny pad surround-

ding it. Reception of the second recurrent vein of the forewing well beyond the proximal end of the submarginal cell II.

Description of the female: Clypeus apical margin with three rather weak teeth, some specimens only with a short tooth in the middle (fig. 3). Frons shining, punctate and slightly rugose. Vertex shining with scattered punctation. Length of flagellomere I 1,9-2,3 x width. Pronotum lateral with large ridges. Shiny scutum with broad transverse ridges (fig. 1), anteriorly punctate. Scutellum coarsely punctate. Metanotum rugose. Shiny propodeal enclosure with strong and irregular rugae and no distinct pad surrounding it. Propodeum laterally and posteriorly reticularly rugose. Shiny mesopleuron before midcoxa with weak microsculpture and flat broad transverse ridges or reticulately rugose. Hindtibia with spines. Petiolus shorter than tergite I. Tergite I of abdomen shining, tergites II-VI with microsculpture. Pygidial area of medium breadth, excavate distally and with distinctly surrounded carina (fig. 10).

Wings infumate. Reception of the second recurrent vein of the forewing well beyond the proximal end of submarginal cell II. Head, thorax and gaster black. Pubescens pale. Body length 7-9 mm.

Description of the male: Clypeus see fig. 7. Frons rugose and punctated. Shiny vertex behind ocelli and with irregular large punctation. Flagellomeres without tyloidea (fig. 14). Length of flagellomere I 1,9-2,1 x width. Pronotum lateral with 5-7 large ridges. Scutum anteriorly punctate, in the middle shining and with as many broad transverse ridges as in female but flatter. Scutellum coarsely punctate. Metanotum rugose. Shiny propodeal enclosure, with strong and irregular rugae and no distinct pad surrounding it. Propodeum posteriorly and laterally reticulately rugose. Shiny mesopleuron before midcoxa with dense broad punctation. Hindtibia with fine spines. Basitarsus of midleg straight and gradually enlarged from base. Petiolus distinctly shorter than tergite I. Tergites of abdomen with microsculpture. Reception of the second recurrent vein of the forewing well beyond the proximal end of submarginal cell II. Gonostyli dorsal fig. 21 and lateral fig. 22, penisvalve fig. 25, volsella fig. 29 and stenum VIII fig. 31.

Head, thorax and gaster black. Pubescens pale. Bodylength 7 mm.

Material examined: Holotype: female, U.S.A., Virginia, Fairfax Co., near Annandale, 14.9.1981, Malaise trap, leg. Davis R. Smith (USNM).

Allotype: male, U.S.A., New Jersey, Burlington Co., Lebanon St. For., 19.8.1958, leg. Evans & Beneway (MCZC).

Further material examined: 24 females and 10 males

1 ♀ Canada, Ontario, Calabogie, 8-13.8.1970, leg. Mason (PMAE).

U.S.A.: 1 ♀ Washington D.C., 1.9.1949, leg. Shapirio (USNM); 1 ♀ D.C. Rock Creek Park, IX.1-7.1950, leg. Shapirio (USNM); North Carolina, Wake Co., 21.5.1950, leg. Townes (AEIC); 1 ♀ Georgia, Stone Mt., 28.4.1927, leg. Fattig (UCDC); Georgia, Richmond Co., Ft. Gordon, 1958, leg. Snelling (UCDC); 1 ♀ Maryland, Prince George's Co., Patuxent Res. Sta., 21.6.1986, leg. Wahl (PMAE); 1 ♀ Maryland, Montgomeri Co., Great Falls, 21.6.1971, (UCDC); 3 ♀ ♀ Massachusetts, Boston, 16.9.1914, leg. Williams (CASC); 1 ♀ Mass., Walpoole, 19.9.1967, leg. Evans (MCZC); 1 ♀ Mass., Woods Hole (MCZC); 1 ♀ Mass., Sagamore, leg. Bequaert (MCZC); 1 ♀ Michigan, Marquette Co., Huron Mountain Club, 27.6.1980, leg. O'Brien (UMMZ); 1 ♀ Michigan, Cheboygan Co., Douglas Lake, Biol. Station, 6-13.7.1990, leg. O'Brien & Scholtens (UMMZ); 1 ♀ New York, Ithaca, 27.6.1947, nesting in tree-trunk, leg. Evans (MCZC); 1 ♀ New York, Ithaca, 1912 (AMNH); 5 ♀ ♀ New York, Huntington, Kalbfleisch Field Research Station, 19.8.1962 (AMNH). 1 ♂ U.S.A. Arkansas, Yell. Co., 4 Mi NE Sanville 25.9.1975 (MUIC); 9 ♂ ♂ Nebraska, Nehawka 1.5.1930, bred from Pine Bark (DEUN); 1 ♂ Wyandanch, L.I., V.27.1917 (MCZC).

***Pemphredon montanella* DOLLFUSS n. sp.**

Etymology: The species is reminiscent of *P. montana* DAHLBOM but it is much smaller in size.

Diagnostic Characters: Clypeus-anterior margin obtuse projecting in the middle as in *Pemphredon montana* (fig. 4). *P. montanella* may be easily distinguished from *P. montana* by the sculpture of the scutum. In *P. montana* the scutum is dull with indistinct, large punctation, especially posteriorly with a dense, distinct finger-print-like sculpture on either side of the middleline. In *P. montanella* n. sp. the shiny scutum has a fine microsculpture and a large punctation drawn out into weak longitudinal furrows at the posterior. Propodeal enclosure irregularly rugose, surrounded by a shiny pad. Reception of the second recurrent vein of the forewing well beyond the proximal end of the submarginal cell II. Pygidial area broad and flat (fig. 11).

Description female: The anterior margin of the clypeus obtuse and projected in the middle (fig. 4). Clypeus shiny with scattered punctation. Length of flagellomere I 2 x width. Shiny scutum with fine microsculpture and large punctation which is drawn out into weak longitudinal furrows at the posterior. Scutellum with the same structure as scutum. Metanotum dull. Propodeal enclosure irregularly rugose and surrounded by a shiny pad. Propodeum posteriorly and laterally oblique, striate. Mesopleuron in front of midcoxa, with the same structure as in scutum. Petiolus shorter than tergite I. Shiny tergites with fine microsculpture. Reception of the second recurrent vein of the forewing well beyond the proximal end of the submarginal cell II. Pygidial area broad and flat (fig. 11). Head, thorax and gaster black. Pubescence pale. Body length 7-8,5 mm.

Male unknown.

Examined material:

Holotype: female, U.S.A., Arizona, S.W.R.S., 5 Mi.W. Portal, Cochise Co., 7.10.1962, leg. V. Roth (AMNH). **Female,** U.S.A., Arizona, Portal Rustler Park, 5.8.1977, leg. L. Masner. (CNCI).

***Pemphredon fischeri* DOLLFUSS n. sp.**

Etymology: The species name is given in honor of Univ.-Dozent Dr. Mag. Max Fischer, Director of the Entomological Department of the Museum of Natural History of Vienna, Austria.

Diagnostic Characters: *Pemphredon fischeri* differs from all males known in the form of the flagellum, see fig. 15 and 16. Propodeal enclosure with close longitudinal ridges surrounded by a shiny pad. Reception of the second recurrent vein of the forewing well beyond the proximal end of the submarginal cell II.

Description male: The apical margin of the clypeus broadly emarginate (fig. 8). Clypeus flat and densely punctate, covered with dense silvery pubescens. Frons between eyes rugose and punctate. Shiny vertex behind ocelli, with scattered punctation. Flagellomeres V and VI strongly swollen on both sides (fig. 15). Flagellomeres III-VI with linear tyloidea (fig. 16). Length of flagellomere I 1,5-1,7 x width. Scutum shiny and smooth, with scattered fine punctation. Scutellum shiny and punctate. Metanotum shiny and punctate. Propodeal enclosure with close longitudinal ridges

surrounded by a broad, shiny pad. Propodeum posteriorly oblique and striated. Propodeum laterally transversely striate. Shiny mesopleuron before midcoxa with punctation. Basitarsus of midleg apically a little bended. Petiolus shorter than tergite I. Hindtibia with fine spines. Reception of the second recurrent vein of the forewing well beyond the proximal end of submarginal cell II. Gonostyli dorsal fig. 20 and lateral fig. 24. Penisvalve fig. 26, Volsella fig. 28 and Sternum VIII see fig. 32. Head, thorax and gaster black. Pubescens pale. Body length 7-8 mm.

Female unknown.

Material examined: Holotype: male, U.S.A., California, Siskiyou Co., McBride Springs, 8.8.1967, 1524 m, leg. Arnaud jr. (CASC).

Male: U.S.A., California, Julian, 12.5.1974, leg. Townes (AEIC).

Male: U.S.A., Idaho, Idaho City, 13.6.1978, leg. Townes (AEIC).

***Pemphredon gusenleitneri* DOLLFUSS n. sp.**

Etymology: The species name is given in honor of Mag. Fritz Gusenleitner, Oberösterreichisches Landesmuseum, Linz, Austria.

Diagnostic Characters: *P. gusenleitneri* is similar to *P. lethifera*, the principal difference is the reception of the second recurrent vein of the forewing being well beyond the proximal end of submarginal cell II, and the form of gonostyle and sternum VIII. Flagellomeres IV-VIII with short linear tyloidea (fig. 17 and 18). Propodeal enclosure irregularly reticular, surrounded by a broad and shiny pad. Petiolus as long as tergite I.

Description male: The apical margin of the clypeus broadly emarginate (fig. 9). Frons between eyes punctate and rugose. Shiny vertex behind ocelli, with scattered punctation. Flagellomeres IV-VIII with short linear tyloidea (fig. 17 and 18). Length of flagellomere I 2 x width. Shiny scutum with fine and scattered punctation. Scutellum shining and punctate. Metanotum shining, with flat punctation. Propodeal enclosure irregularly reticular, surrounded by a broad and shiny pad. Propodeum posteriorly shiny and strongly punctate. Mesopleuron in front of midcoxa shiny and strongly punctate. Petiolus as long as tergite I. Hindtibia with long desist hairs. Reception of the second recurrent vein of the forewing well beyond the proximal end of submarginal cell II. Gonostyli dorsal see fig. 19, lateral

fig. 23, Penisvalve fig. 27, Volsella fig. 30 and sternum VIII see fig. 33. Head, thorax and gaster black, tarsi brown. Pubescens pale. Body length 7 mm.

Female unknown.

Material examined: Holotype: male, Laos, Vientiane Prov., Phou Kou Khouei, Ban Van Eue, 15.6.1965, leg. Cressit (BPBM).

***Pemphredon laotis* DOLLFUSS n. sp.**

E t y m o l o g y : The species name derives from the name of the country.

D i a g n o s t i c C h a r a c t e r s : *Pemphredon laotis* and *P. pulawskii* n. sp. differ from other species of *Pemphredon* by broad transverse ridges on the scutum (fig. 1 and 2). *P. laotis* differs from *P. pulawskii* by longitudinal ridges on propodeal enclosure and a shiny pad surrounding it. Femora and tibiae are red-brown. Reception of the second recurrent vein of the forewing well beyond the proximal end of submarginal cell II. Petiolus a little longer than tergite I.

D e s c r i p t i o n f e m a l e : Clypeus projecting in the middle (fig. 6). Length of the flagellomere I 2,4 x width. Frons between eyes rugose and punctate. Vertex shiny and coarsely punctate. Pronotum with coarse ridges laterally. Scutum shiny and with broad transverse ridges (fig. 2). Scutellum with ridges like scutum. Metanotum shiny. Propodeal enclosure with close longitudinal ridges, surrounded by a broad shiny pad. Propodeum with oblique ridges posteriorly and laterally. Mesopleuron in front of midcoxa with strong transverse striation. Petiolus a little longer than tergite I. Reception of the second recurrent vein of the forewing well beyond the proximal end of the submarginal cell II. Pygidial area rather narrow, apically strongly excavate, delimited by a sharp carina (fig. 13). Shiny tergites of abdomen, with sparse fine punctation. Black except for the following which are red-brown: Trochanter, femora, tibiae, median part of mandibles, maxilar palpes and wing veins. Pubescens pale. Body length 10 mm.

Male unknown.

Material examined: Holotype: female, Laos, Sayaboury Prov., Sayaboury, 13.4.1966, leg. Bishop (BPBM).

***Pemphredon kashmirensis* DOLLFUSS n. sp.**

Etymology: The species name derives from the name of the Indian region Kashmir.

Diagnostic Characters: *Pemphredon kashmirensis* is similar to *P. inornata* SAY. The principal differences are the shape of Clypeus and propodeal enclosure. The anterior margin of the clypeus in *P. kashmirensis* is flat and angularly projecting in the middle (fig. 5). The anterior margin of the clypeus in *P. inornata* is convex and threedentate, lateral teeth are weak and hardly to be seen, the middletooth is angularly projected and rised. Propodeal enclosure in *P. kashmirensis* with short longitudinal ridges, in *P. inornata* with irregular ridges. Reception of the second recurrent vein of the forewing before the proximal end of submarginal cell II. Petiolus as long as tergite I.

Description female: Clypeus flat, anterior margin angularly projected in the middle (fig. 5). Clypeus shiny, with fine punctation. Frons between eyes punctate and rugose. Shiny vertex behind ocelli with scattered punctation. Length of flagellomere I 2,3 x width. Scutum smooth and shiny, with sparse but distinct punctation. Scutellum similar to Scutum. Metanotum shiny. Propodeal enclosure with short longitudinal ridges, surrounded by a broad and shiny pad. Propodeum densely and coarsely punctate posteriorly, laterally reticular, ventrally with coarse rugae. Mesopleuron in front of midcoxa coarsely rugose. Reception of the second recurrent vein of the forewing before the proximal end of submarginal cell II. Shiny tergites, with weak microsculpture. Pygidial area broad (fig. 12). Head, thorax and gaster black. Pubescens pale. Body length 9 mm.

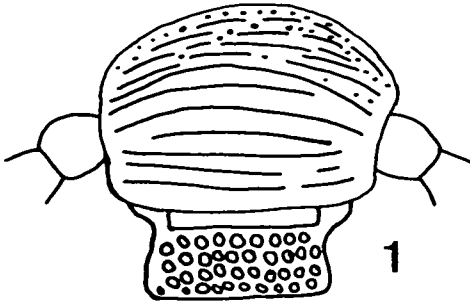
Male unknown.

Material examined: Holotype: female, India, Kashmir, Srinagar, 8.8.1980, 1600 m, leg. Williams, Cambridge Expedition to Kashmir BM 1980-409 (BMNH).

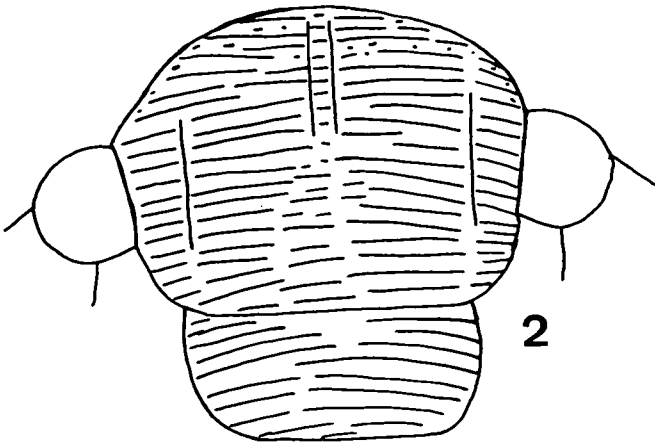
Reference cited

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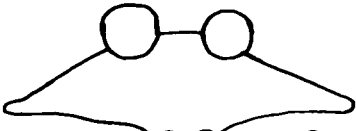
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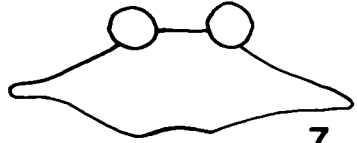
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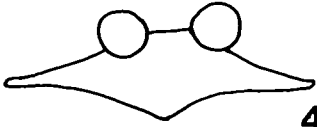
laotis ♀



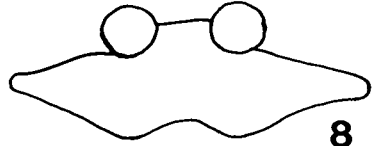
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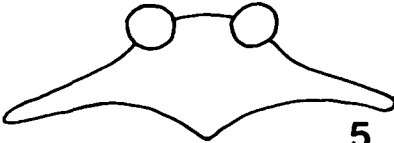
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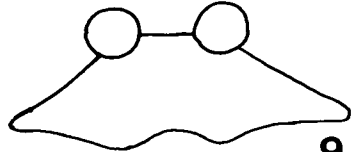
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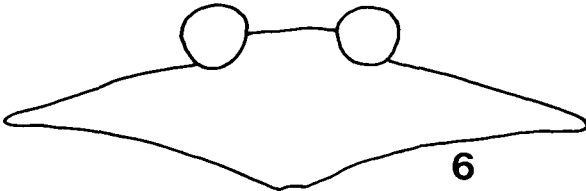
fischeri ♂ **8**



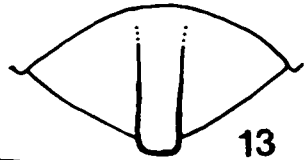
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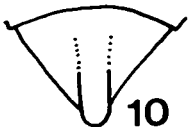
gusenleitneri ♂ **9**



laotis ♀ **6**



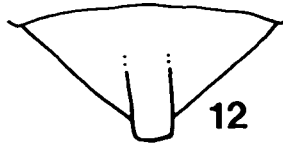
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pulawskii **10**

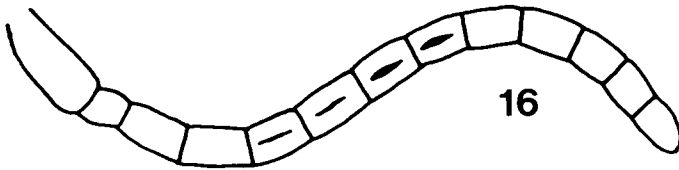
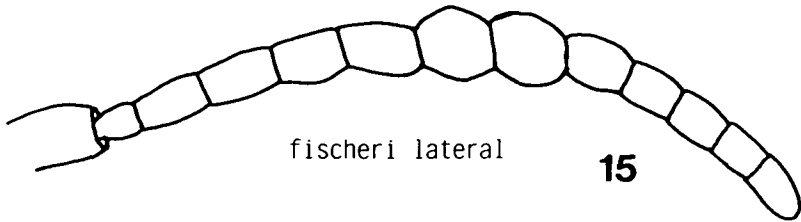
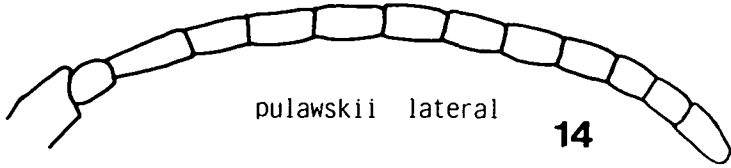


montanella **11**

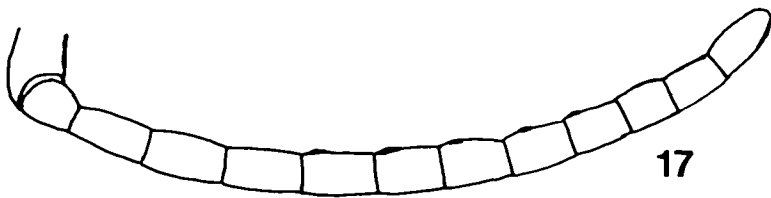


kashmirensis **12**

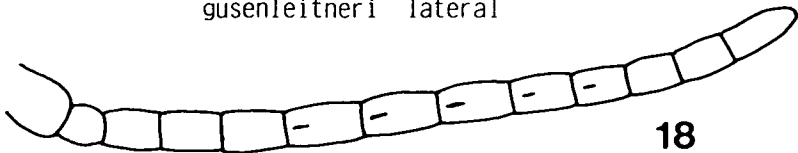
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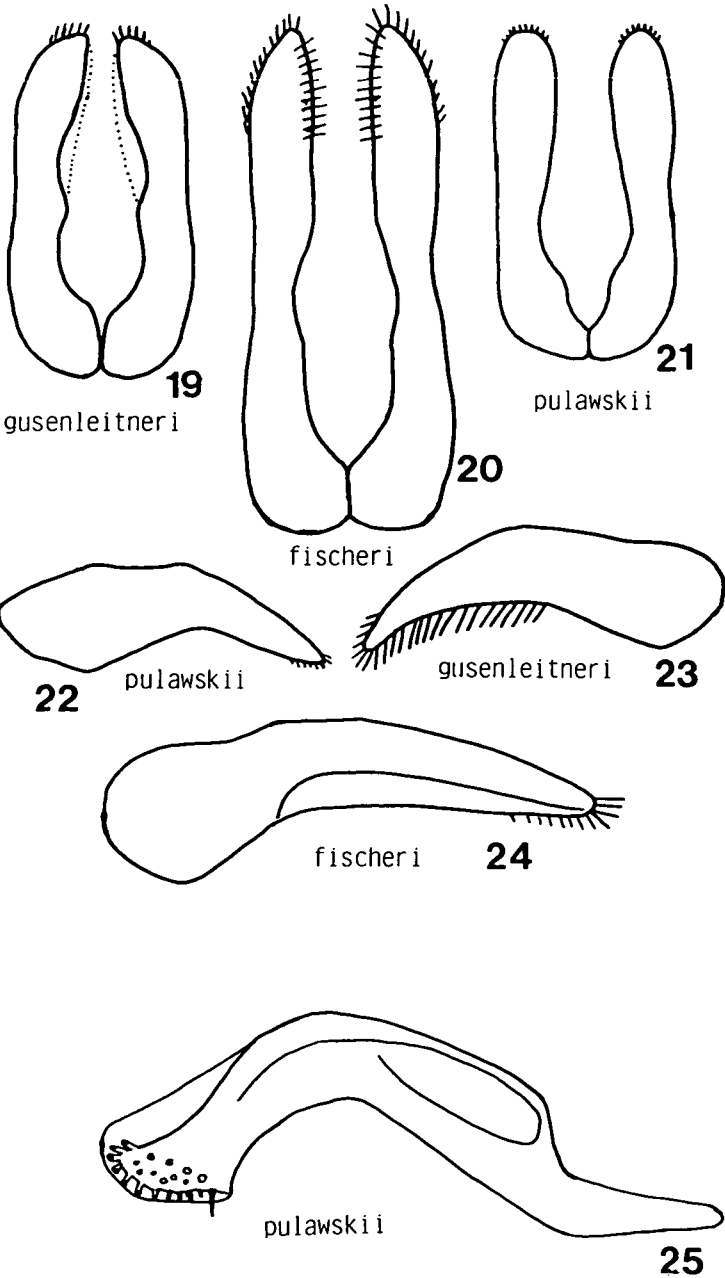
fischeri ventral

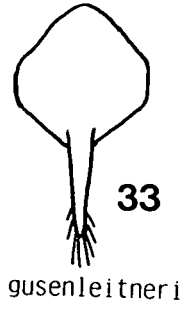
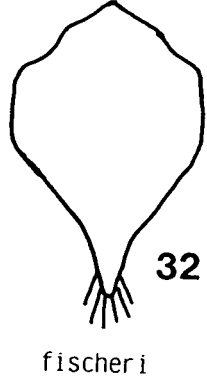
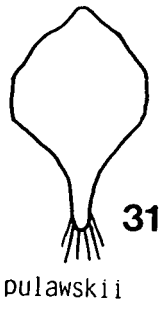
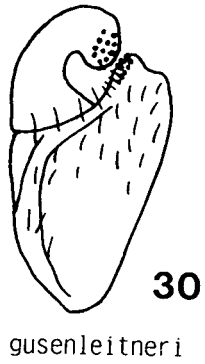
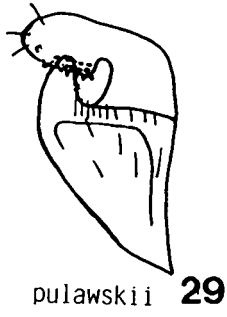
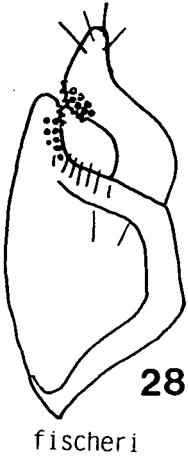
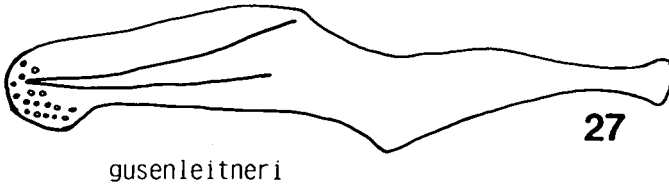
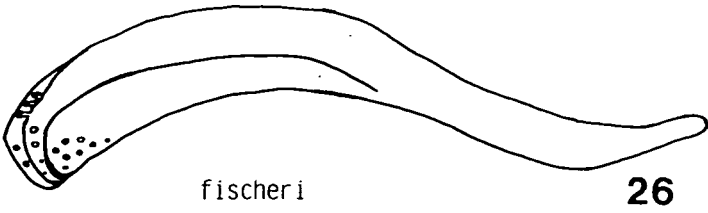


gusenleitneri lateral



gusenleitneri ventral





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