

Revision of the Nearctic
GLYPHICNEMIS Foerster
(Hymenoptera: Ichneumonidae, Gelinae)

John Luhman
Division of Biological Control
Department of Entomology
University of California
Riverside, CA 92521

INTRODUCTION. GLYPHICNEMIS Foerster is a small Holarctic genus in the subtribe Endaseina of the Gelini. Nearctic species were placed in PHYGADEUON Gravenhorst until Townes (1944) placed them in the subgenus GLYPHICNEMIS within ENDASYS Foerster. However, earlier Cushman (1925) had transferred PHYGADEUON CRASSIPES Provancher, a junior synonym of G. MANDIBULARIS (Cresson), to GLYPHICNEMIS, and the Palearctic species, at first placed in PHYGADEUON, were included by Habermehl (1916) in GLYPHICNEMIS, reduced to a subgenus within STYLO-CRYPTUS Thomson (1873). This status was continued until Townes (1970) listed and described GLYPHICNEMIS as a separate genus.

I recognize 4 valid Nearctic species. Two species, MANDIBULARIS (Cresson) and CALIFORNICUS (Cresson), are redescribed. The latter is resurrected from synonymy with MANDIBULARIS. Two new species are described: VULGARIS which is eastern and common, and NIGRIFEMORUM, western and uncommon.

MATERIALS and METHODS. This study was based on over 800 Nearctic specimens borrowed from the following collections: California Academy of Sciences, San Francisco, (CAS); Canadian National Collection, Ottawa, (CNC); Clement Dasch, Muskingum College; Museum of Comparative Zoology, Harvard (MCZ); Universite Laval, Quebec, (UL); University of Minnesota, St. Paul, (UM); Academy of Natural Sciences, Philadelphia (ANSP); United States Museum National Museum, Washington D.C., (USNM). In addition, 19 Palearctic specimens were from the Zoological Institute, Academy of Sciences, Leningrad.

The terminology used in this revision is that of Townes (1969), ex-

cept "area dentipara" is used instead of "second lateral area"; "trochantelli" instead of "second trochanters"; and "tergum(-a)" instead of "tergite(s)." The length of the hind femur includes the trochantellus. Pinned specimens were examined under a dissecting microscope, usually at 45x, with illumination from a 75 watt, incandescent bulb. Drawings were done using a dissecting microscope with a camera lucida attachment.

BIOLOGY and HOSTS. Townes (1965) recorded G. PROFLIGATOR (Fabricius) from DENDROLIMUS ALBOLINEATUS Mats. (Lasiocampidae) in Japan. However, this record is doubtful since no other DENDROLIMUS have GLYPHICNEMIS recorded from them (Thomson, 1957). In the European part of the U.S.S.R., G. PROFLIGATOR has been reared from European pine sawfly, NEODIPRION SERTIFER (Geoffrey) (Kolomiets et al., 1979). However, it is not one of the more common parasites of this sawfly, being 0.4% of all reared parasites according to Ryvkin (1963). In the Nearctic, GLYPHICNEMIS is conspicuously absent from lists of parasites reared from sawflies. This leads me to believe that the usual hosts are not sawflies, but another insect that pupates beneath the soil. The morphology of the genus provides a clue to another possible host. GLYPHICNEMIS has strongly developed tibial spines which presumably aid in emerging from subterranean cocoons. In the female they are very strongly developed, and may be used for digging to parasitize such cocoons. The same body form with strong tibial spines occurs in RICHTICHNEUMON RESIDUUS (Say) (Ichneumoninae) which has been reared from geometrid larvae (Heinrich, 1977), and emerges from

subterranean pupae.

ZOOGEOGRAPHY. The 4 Nearctic species are closely related to those in the Palearctic. They can be placed into 3 groups along with the 5 Palearctic species studied: *CLYPEALIS* (Thomson) with *VULGARIS* n. sp.; *ATRATUS* (Strobl) with *CALIFORNICUS* (Cresson) and *NIGRIFEMORUM* n. sp.; and *VAGABUNDUS* (Gravenhorst) with *PROFLIGATOR* (Fabricius), *SATOI* (Uchida), and *MANDIBULARIS* (Cresson). From the widespread distribution of these species throughout the Holarctic Region it would appear that the species groups evolved before Beringia was emergent in the early Tertiary (Matthews, 1980). Exchange of species between Asia and North America via Beringia would have occurred throughout the Tertiary until the Pliocene. The present day Nearctic species could be seen as descendents of Palearctic ancestors. Further speculation on the biogeography and evolution of *GLYPHICNEMIS* requires host information and distribution of the Palearctic species.

GLYPHICNEMIS Foerster

GLYPHICNEMIS Foerster, 1869. Verh. Naturh. Ver. Preuss. Rheinlande 25: 181. Type: *PHYGADEUON VAGABUNDUS* Gravenhorst. Subsequent designation by Ashmead, 1900.

GNATHOCRYPTUS Thomson, 1873. Opusc. Ent. 5: 520, 521. Type: *PHYGADEUON VAGABUNDUS* Gravenhorst. Original designation.

SEMIODES Harrington, 1894. Canad. Ent. 26: 247. Type: *SEMIODES SEMINIGER* Harrington (= *GLYPHICNEMIS CALIFORNICUS* (Cresson)) Monobasic.

DIAGNOSIS. *GLYPHICNEMIS* is structurally very similar to *ENDASYS* and *AMPHIBULUS* Kriechbaumer. All three share the transverse break in front of the prescutellar groove on the hind edge of the mesoscutum, usually with a strong, central longitudinal ridge dividing the groove in two (ridge often reduced or absent in *AMPHIBULUS*). All have strong tibial spines on the outer face and apex of the tibiae. *GLYPHICNEMIS* resembles *AMPHIBULUS* by the wide clypeus with apical margin sharp and upturned, the more numerous tyloids of the males, the slender petiole, strong sternaulus, elongate-hexagonal areola,

area dentipara more nearly rectangular, and the lack of distinct apophyses present in most *ENDASYS*. Diagnostic features of *GLYPHICNEMIS* are the distinctly subapical insertion of the hind tibial spurs (Fig. 2) and tarsi, as well as the mandible with the distinctly shorter upper tooth. In both *AMPHIBULUS* and *ENDASYS* the lower tooth is always shorter, and the hind tarsi and tibial spurs are apical. Townes (1970) gives a complete description and figure of *GLYPHICNEMIS*. Diagnosis of species relies mainly on color and punctational patterns in addition to variations of several generic characters.

Key to the Nearctic *GLYPHICNEMIS*

1. Males..... 2.
- 1! Females..... 6.
2. Trochanters white or pale yellow; clypeus black; flagellum with 7 to 8 tyloids (Fig. 3), small species, 5 to 6 mm long;.. *VULGARIS*, n. sp.
- 2! Trochanters orange or black; if whitish, clypeus orange; 4 or fewer tyloids (Fig. 3,5,8), larger species, over 6 mm long:..... 3.
3. Hind coxa orange; flagellum orange or black:..... 4.
- 3! Hind coxa black to orange-black; flagellum black:..... 5.
4. Hind femur orange with black apex (Fig 2) frons and face very densely, coarsely punctate-rugulose; usually 4 distinct tyloids, flagellum orange; *MANDIBULARIS* (Cresson).
- 4! Hind femur entirely orange (Fig 7); frons and face densely, finely punctate; face finely granular; 3 distinct tyloids; flagellum black:.....light forms*CALIFORNICUS* (Cresson).
5. Trochantelli orange (Fig. 6,7); front and middle femora yellow; 5th abdominal sternum not membranous medially:.....dark forms*CALIFORNICUS* (Cresson).
- 5! Trochantelli black (Fig. 4); front and middle femora blackish at least basally; 5th abdominal sternum membranous medially: *NIGRIFEMORUM*, n. sp.

6. Flagellar segments 6-10 viewed from above distinctly white, remaining segments black.; abdominal terga 2 and 3 with some black, apex black:
.....VULGARIS, n. sp.
- 6! Basal half of flagellum viewed from above pale-orange, apical half black; sometimes segments 5-10 or 11 whitish; abdominal terga 2 and 3 orange, apex orange or black:..... 7.
7. Frons and propleurum rugulose and coarsely punctate; hind femur and tibia orange with black apices; scape, tegula, coxae, and trochanters always orange (or coxae and trochanters sometimes with whitish):
..... MANDIBULARIS (Cresson).
- 7! Frons and propleurum smoother, densely to sparsely, finely punctate; color pattern not as above:..... 8.
8. Apex of abdomen orange; coxae and trochanters often entirely orange:
..... CALIFORNICUS (Cresson).
- 8! Apex of abdomen black; coxae and trochanters black, never entirely orange:..... NIGRIFEMORUM, n. sp.

GLYPHICNEMIS CALIFORNICUS (Cresson)
renewed status and new combination
(Fig. 5-7)

- PHYGADEUON CALIFORNICUS Cresson, 1878. Acad. Nat. Sci. Phila. Proc., p. 358. Male, California (ANSP). HOLOTYPE.
- ?PHYGADEUON CRASSIPES: Cresson, 1878. Acad. Nat. Sci. Phila. Proc., p. 358. Females (description, British Columbia, California). Misidentified.
- SEMIODES SEMINIGER Harrington, 1894. Canad. Ent. 26: 247. Male, Victoria, British Columbia. Holotype.
- PHYGADEUON SEMINIGER: Harrington, 1897, Can. Ent. 29: 43.
- ENDASYS (GLYPHICNEMIS) MANDIBULARIS CALIFORNICUS: Townes, 1944, Cat. Recl. Nearctic Ich., pt. 1: 216; (1951), Hym. Amer. No. Mex., p. 246.

MALE DIAGNOSIS. Medium size, 6 to 7 mm long; type and light forms with orange scape, clypeus, tegula, abdomen except apex and most of petiole, and legs (Fig. 7) except occasional blackening of apex of hind tibia and

tarsi; usually 3 tyloids (sometimes faint 4th) on flagellar segments 10-12 (or 13) (Fig. 5), tyloids linear and sharp, shiny on top; 5th abdominal sternum not membranous medially like NIGRIFEMORUM. Dark forms with black scape, clypeus, tegula, coxae and first trochanters, hind femur at least apically, base and apex of hind tibia (Fig. 6), often petiole except apex, and abdomen apex.

MALE DESCRIPTION. Black: Type and light forms with flagellum, head capsule except clypeus and mandible, thorax except tegula, often most of petiole except apex, abdomen apex, and sometimes apex of hind tibia, and usually most of hind tarsi. Dark forms with black head, thorax except often tegula, coxae, first trochanters (not trochantelli), usually hind femur apically (sometimes mostly blackish), hind tibia basally and apically, tip of abdomen, and usually petiole except apically. Intermediate forms occur.

Orange: Type and light forms with scape, clypeus, mandible, tegula, legs except sometimes apex of hind tibia and most of hind tarsi, and abdomen except sometimes most of petiole. Dark forms usually without orange on head, thorax, coxae and first trochanters, and always with black apices on hind femur and tibia.

Punctation: Frons with dense, finely distinct pits, often slight horizontal rugulosity; variably sparse, obscure pits on temple, propleurum, and most of mesopleurum, its central area more distinctly pitted and somewhat rugulose.

Shape: Areola broadly hexagonal, often elongated apically; area dentipara narrowly trapezoidal, slightly higher than wide, with distinct, moderate carinae, gradually higher apically; tyloids nearly linear, sharp, and shiny on top (NIGRIFEMORUM with tyloids elongate-elliptical, flattened and mat); propodeal spiracle elongate elliptical; hind femur only moderately swollen, depth over length .22-.23.

FEMALE DIAGNOSIS. Medium size, 6 mm long; easily separated from VULGARIS by lacking white flagellar segments, entire basal half of flagellum brownish, and clypeus orange at least apically; differs from MANDIBULARIS by the hind femur with orange or

blackish-orange but not at apex, and punctation of frons and propleurum dense to sparse with finely distinct pits, not with a coarse, rugulose surface. Palearctic *ATRATUS* (Strobl) very similar to dark forms, but *CALIFORNICUS* always with orange on all or part of clypeus, punctation slightly finer on temple, frons, and propleurum, and hind femur sometimes blackish. Differs from *NIGRIFEMORUM* mainly by orange clypeus, tegula, legs, and abdomen, also radial cell longer and straighter apically.

FEMALE DESCRIPTION. Black: Light forms with apical half of flagellum, head capsule except scape, clypeus, and mandibles; thorax except tegula; petiole often basally. Dark forms with black basal half of clypeus, coxae, hind femur, and base and apex of hind tibia. Intermediate forms occur.

Orange: Light forms with basal half of flagellum, scape, clypeus, mandible, tegula, abdomen, and legs. Dark forms with orange scape, clypeus apically, front and middle legs beyond coxae, and hind tibia except base and apex.

Punctation: Frons and propleurum variably dense with finely distinct pits, often slightly rugulose; temple with variably sparse, more or less distinct pits.

Shape: Areola broadly hexagonal; area dentipara narrow with fine carinae.

REMARKS. This species has been confused with *MANDIBULARIS* because the apices of the hind femur and tibia are often black (Fig. 2,6). However, *MANDIBULARIS* is eastern, has distinctly coarse and rugulose punctation on the head, male usually has an orange flagellum with 4 distinct tyloids, female often has flagellar segments 5-10 or 11 pale yellow-white, and coxae of both sexes are often pale yellowish. *G. CALIFORNICUS* is western, has finer punctation on the head, male has black flagellum with 3 distinct tyloids (often a faint 4th), female with flagellum pale orange on basal half, and both sexes never have coxae pale yellowish. The dark forms of *CALIFORNICUS* are diagnosed by black coxae; the light forms by orange coxae.

RANGE. California, Oregon, Washington, British Columbia, and Alaska,

eastward to Alberta, Saskatchewan, Idaho, Montana, South Dakota, and Colorado. Dark forms are generally collected from British Columbia to Alaska, as well as in Colorado and the northern plains; light forms, from Washington southward to California. Collections dates are June through late August.

HOLOTYPE. Male (ANSP). Identified by labels as follows: (imprinted) "Cala.", (red) "TYPE No. 1217.1", (white with pink border, written) "Phygadeuon californicus". Specimen complete except for lost flagellar segments 25-apex of both antennae. Male is a light form with orange legs except for apex of hind tibia which is blackish.

PARATYPES. The 2 males (ANSP) so labelled are not congeneric. Each is a species of *ENDASYD*. These specimens are labelled "Cala.", (blue) "PARATYPE No. 1217-2", and "PARATYPE No. 1217-3".

MATERIAL STUDIED. (Canada & U.S.A., 177 specimens) ALASKA-- (8 males) Anchorage: June 15, 1921, J.M. Aldrich (USNM); (7 males) Fairbanks: January 20, 1921, J.M. Aldrich (USNM); (7 males) Delta Junction: July 6 & 7, 1977, B. & C. Dasch. ALBERTA-- (3 males) Banff: June 29, July 20, 1925, O. Bryant (USNM), July 25, 1922, C.B.D. Garrett (CNC). BRITISH COLUMBIA-- (7 males) Burnaby: July, 1979, July 14, 16, 24, 1978, D. Gillespie (CNC); (2 males) Burns: July 22, 1977, B. & C. Dasch; (1 male) Cultus Lake, July 1, 1948, H.R. Foxlee (CNC); (1 male) Lake Errock near Deroche: June 2, 1953, Edith Mason (CNC); (1 female) Mt. Robson Prov. Pk.: July 23, 1977, B. & C. Dasch; (1 female) Vancouver: August 5, 1938, G.S. Walley (CNC). CALIFORNIA-- (1 male) Blocksburg: June 19, 1935, E.W. Baker (OSU); (8 males) Marin Co., Lily Pond, Alpine Lk., 1500 ft: July 7-28, 11, 15, 15-18, 18, 1970, D. Munroe (CNC); (1 female) Siskiyou Co., headwaters E. fork of S. Fork Salmon R., Cecilville-Callahan Rd., 6000 ft: July 31, 1968, H.B. Leech (CAS); (2 males, 1 female) Soda Springs, Tulumne Meadows, 1600-8600 ft, G.R. Pilate (USNM). COLORADO-- (1 male), #2009, C.F. Baker (USNM); (1 male) Boulder Canyon: July 24, 1964, C. Dasch; (1 male) Boulder Co., Middle Boulder Ck., 16 km west of Boulder

Hwy. 119, 2280 m: August 8, 1973, P.H. Arnaud, Jr. IDAHO-- (1 male) Kassel R.S.: July 25, 1962, M.M. Furniss (USNM); (1 male) McCall, 5025 ft: June 22, 1926, R.W. Haegele (USNM); (1 male) Port Hill: August 10, 1926, R.W. Haegele (USNM); (1 male) Warm Lake: August 8, 1962, R.W. Haegele (USNM). MONTANA-- (1 male, 1 female) Bozeman: July 26, 1977, B. & C. Dasch, July 7, 1973, R., B. & C. Dasch; (2 males) Glacier Nat. Pk.: July 4, 1978, B. & C. Dasch. OREGON-- (5 males, 11 females) Corvallis: June 20, July 1, 1931, J. Schuh (USNM), June 1, 10, July 2, 1931, (USNM), July 7, 11, 1965, C. Dasch, August 17, 1932, H. Scullen (USNM), June 4, 1941, G. Ferguson (OSU), July 14, 1938, J.D. Vertrees (OSU); (1 male) Deschutes Nat. Forest, Smiling R. Cp.: July 17, 1965, C. Dasch; (3 males) Jackson Co., Ashland Mt., above timberline: August 5, 1952, H.A. Scullen (OSU); (1 male) Mary's Peak, 4000 ft: August 7, 1965, C. Dasch; (5 males, 2 females) Wallowa National Forest, Lick Ck. R. S., 4600 ft: August 12, 1937, Bolinger & Jewett (OSU); SASKATCHEWAN-- (1 female) Grenfell: June 23, 1977, B. & C. Dasch. SOUTH DAKOTA-- (1 male, 1 female) Custer: July 18, 1924, (USNM). WASHINGTON-- (1 female) Bear R.: August 21, 1930, (OSU); (1 female) Coupeville: June 20, (OSU); (1 male) Nasel R.: August 31, 1931, (OSU); (1 male) Whidby Is.: July 20, 1898; (4 males, 2 females) Olympia: July 3, 1944, (USNM), June 26, 1896, July 2, 9, 1895, T. Kincaid (OSU); (1 female) Samish: August 1924, (OSU); (7 males, 2 females) Seattle: July 6, 27, 1901, August 20, 1898, August 10, 1899, (OSU); (1 male) Spokane: C.V. Piper (USNM). YUKON TERRITORY-- (17 males, 2 females) Dawson City: July 15, 16, 17, 1977, C. Dasch; (1 male) Morley R. Cp. mi. 777, Alcan Hwy.: July 19, 1977, B. & C. Dasch.

GLYPHICNEMIS MANDIBULARIS (Cresson)
(Fig. 1-2)

PHYGADEUON MANDIBULARIS Cresson, 1864. Ent. Soc. Phila. Proc. 3: 311. Female, Illinois (ANSP). HOLOTYPE.

ISCHNUS RUFICORNIS Provancher, 1875. Nat. Can. 7: 110. 2 Males, Quebec (UL). Lectotype and paralectotype

designated by Barron, 1975, Nat. Canad. 102(4): 548-549.

PHYGADEUON RUFICORNIS Provancher, 1875. Nat. Can. 7: 179, 182. 2 Males, Quebec (UL). Lectotype and paratype designated by Barron, 1975, Nat. Canad. 102(4): 548-549. References-- Provancher: (1879) Nat. Canad. 11:75 (key, description, I. RUFICORNIS Prov. synonymized), (1882) 13:336 (key), (1883) Petite Faune Ent. Canada Prov. Queb. 2:321, 775; (1886) Addit. Corr. Faune Hym. Prov. Queb. Fam. Ich., p.50. Viereck: (1917) Bull. Conn. Geol. Nat. Hist. Surv. 22:336 (key, list-- Connecticut). Johnson: (1927) Biol. Surv. Mt. Desert Region 1:142 (list-- Maine). Carlson: (1979) Cat. Hym. Amer. No. Mex., p.418 (preoccupation in PHYGADEUON Gravenhorst, 1829, and in GLYPHICNEMIS by Provancher, 1875).

PHYGADEUON CRASSIPES Provancher, 1877. Nat. Can. 9: 11. Female, Quebec (UL). Lectotype designated by Gahan and Rohwer, 1918, Canad. Ent. 50:135. References-- Provancher: (1879) Nat. Canad. 11:74 (key, description), 11:268 (list-- Quebec). ?Taylor: (1884) Canad. Ent. 16:91 (list-- British Columbia, is misidentification). Harrington: (1897) Canad. Ent. 29:43 (description). Viereck: (1917) Bull. Conn. Geol. Nat. Hist. Surv. 22:336 (key). Townes: (1944) Cat. Reclass. Nearctic Ich., p.216 (synonymy). Barron: (1975) Nat. Canad. 102(4):456 (type material of Provancher).

GLYPHICNEMIS CRASSIPES: Cushman, 1925, Jour. Wash. Acad. Sci. 15:389 (generic transfer); (1928) Mem. Cornell Univ. Agr. Exp. Sta. 101:928 (list-- New York).

ENDASYS (GLYPHICNEMIS) MANDIBULARIS MANDIBULARIS: Townes, 1944, Cat. Reclass. Nearctic Ich., p.216; (1951) Hym. Amer. No. Mex., p.246-247.

GLYPHICNEMIS MANDIBULARIS: Townes, 1970, Mem. Amer. Ent. Inst. 12:84. Carlson: (1979) Cat. Hym. No. Mex., p.418.

MALE DIAGNOSIS. Large size, 7 to 8 mm long; orange scape, clypeus, mandible, hind legs except tarsi and apices of femur and tibia (Fig. 2),

abdomen except apex; yellow to whitish on front and middle coxae; tegula yellow; extremely coarse punctation on head; frons rugulose; usually 4 distinct tyloids on flagellar segments 10 to 13 (Fig. 1). Resembles only Palearctic VAGABUNDUS (Grav.) which has all black head, coxae, trochanters, and bases of femora.

MALE DESCRIPTION. Black: Head capsule except clypeus and mouth; thorax except tegula; apex of abdomen; apices of hind femur and tibia, hind tarsi.

Orange: Antennae, clypeus, abdomen except apex, hind femur and tibia except apices.

Yellow: Tegula, front and middle coxae and trochanters (sometimes whitish), hind trochanters, front and middle femora and tibiae.

Punctation: Rugulose frons and face; variably dense to sparse with distinct pits on temple, propleurum, and mesopleurum (latter rugulose and sparsely punctate on central area).

Other: Areola broadly hexagonal; propodeal carinae very strong; 4 (sometimes 3) tyloids on flagellar segments 10 to 13 (or 12).

FEMALE DIAGNOSIS. Large size, 7 to 8 mm long; orange scape, clypeus, mouth, legs except apices of hind femur and tibia, all of abdomen; rugulose frons and propleurum. Only Palearctic VAGABUNDUS similar, but with black head, coxae, and trochanters.

FEMALE DESCRIPTION. Black: Apical half of antennae, head capsule except clypeus and mouth, and often medially swollen area of face; thorax except tegula; apices of hind femur and tibia (often lightly infuscate).

Orange: Scape, clypeus, mandible, often medial swollen area of face, tegula, usually hind corner of pronotum, abdomen, legs except hind tarsi (often infuscate) and apices of hind femur and tibia.

Punctation: Frons, propleurum, and mesopleurum coarse and rugulose; temple distinctly punctate, pits variably dense to sparse;

Shape: areola hexagonal, slightly flattened; area dentipara narrowly rectangular with reduced but distinct carinae.

RANGE. Eastern North America and southeastern Canada, westward to Minnesota and Kansas. Collections May

through August.

HOLOTYPE. Female (ANSP). Identified by labels as follows: (imprinted) "Ill.", (red) "TYPE No. 1224-", (pink-bordered, written) "Phygadeuon mandibularis Cresson" with "Ill" written on the left margin. Complete except for missing 5th tarsal segment of left hind-leg, and right front-leg beyond coxa. There were probably no other specimens in the type series since the type number is not "1224.1". Cresson numbered all his paratypes from the number of the type (Azuma, pers. comm.). The number to the right of the decimal tells the number of the specimen: the type is ".1", the paratypes ".2", ".3" etc. (see CALIFORNICUS paratypes).

MATERIAL STUDIED. (Canada and U.S.A., 475 specimens) CANADA (no locale)--(5 males, 1 female): C.F. Baker (USNM).

CONNECTICUT-- (1 male) Hartford: Ashmead (USNM); (1 female) Lyme: June 18, 1918, W. Middleton (USNM). KANSAS-- (2 males) Riley Co.: June, F. Marlatt (USNM). MARYLAND-- (1 male) Wheaton: June 18, 1923, C. Dasch. MICHIGAN-- (1 male): Ag. Coll., C.F. Baker (USNM). MINNESOTA-- (1 female) Itasca Co., Grand Rapids, N.C. Exp. Sta.: July 10, 1973, (UM). MISSOURI--(1 male): June, 1945, (USNM). NEW BRUNSWICK-- (1 male) Kouchibouguac Nat. Pk.: August 23, 1977, S.J. Miller (CNC). NEW HAMPSHIRE-- (1 male): det. Viereck, (USNM). NEW YORK-- (1 female): #2334, C.F. Baker (USNM); (1 female) Allegany St. Pk.: August 1, 1940, A.R. Shadle (USNM); (21 males, 3 females) Ithaca: June 14, 1906, Cushman (USNM), June 1-18, July 3-24, August 1, 1950-1953, C. Dasch; (1 female) N. W. Long Island: April 14, 1956, R. Latham (USNM); (2 males) Vestal: June 28, 1980, C. Dasch. OHIO-- (1 male) East Harbor: August 17, 1961, C. Dasch; (2 males, 1 female) Findley: June 30, July 1, 1967, C. Dasch; (13 males, 1 female) Jefferson St. Pk.: June 22-July 7, 1974, J. Mills (Dasch); (21 males, 21 females) New Concord: May 24-29, June-July, 1956-1982, C. Dasch; (17 males, 3 females) Otsego, McCallister Bio. Sta.: May 22-June, July 4, August 1, 1977-1982, C. Dasch; (2 males, 1 female) Steubenville: June 23, 23, 1979, C. Dasch; (3 males)

Wills Ck. Res.: June 20, 1971, June 28, 1970, C. Dasch. ONTARIO-- (1 male) Algonquin Prov. Pk.: August 16, 1974, B. & C. Dasch; (1 male) Brighton: August 3, 1956, (CNC); (1 female) Fitzroy: July 11, 1938, O. Peck (CNC); (1 male) Gananoque: July 9, 1941, G.S. Walley (CNC); (5 males) Gloucester: June 24-30, July 5-7, 1977, (CNC); (1 female) Go Home Bay: June 22, 1922, G.S. Walley (CNC); (1 male, 2 females) St. Lawrence Is. Nat. Pk., McDonald Is.: July 13, 23, 1976, A. Carter (CNC); (7 males, 18 females) Simcoe: June 22, 24, 29, 30, 1939, G.S. Walley (CNC); (1 male) Toronto: July 1, 1889, (CNC). PENNSYLVANIA-- (1 male, 1 female): #2045, C.F. Baker (USNM); (2 females) Camphill: June 25, 1917, W.S. Fisher (USNM); (1 male) Enola: June 12, 1909, P.R. Meyers (USNM); (8 males, 1 female) Gaines: June 29-July 1, 1980, C. Dasch; (3 males, 2 females) Highspire: June 19, 1909 & 1910, W.S. Fisher (USNM). PRINCE EDWARD ISLAND-- (4 males) Brackley Beach: August 7, 1960, C. Dasch. QUEBEC-- (2 males): homotypes of PHYGADEUON RUFICORNIS Provancher and P. CRASIPES Provancher, det. Rohwer (USNM); (1 male, 1 female) Aylmer, Queen's Pk.: July 23, 1924, July 25, 1922, C.B. Hutchings (CNC); (1 female) Brome: June 15, 1936, G.S. Walley (CNC); (1 female) Duchesnay: August 11, 1942, J.I. Beaulne (USNM); (1 male) Hemmingford: July 10, 1925, G.S. Walley (CNC); (1 male, 1 female) Hull: July 19, 1914, J.I. Beaulne (CNC); (3 males) Quebec City: Laval Univ.-- June 26-July 2, 1971, J.R. Barron (CNC), 3 miles W.-- August 3, 1981, B. & C. Dasch; (1 male) Rigaud: June 19, 1941, J. Ouellet (USNM). VERMONT-- (1 female) Rutland, Chitenden: August 15, 1916, (USNM). WEST VIRGINIA-- (69 males, 4 females) Bowden: June & July, 1979-1982, C. Dasch; 3 males Bethany: June 6, 1952, C. Dasch; (1 male) Spruce Knob, 4862 ft: July 13, 1979, B. & C. Dasch. WISCONSIN-- (1 male, 1 female) Milwaukee: det. Cushman (USNM).

GLYPHICNEMIS NIGRIFEMORUM, new species
(Fig. 3-4)

MALE DIAGNOSIS. Medium small, 5.5 to 7 mm long; mostly black except tibiae and abdominal terga 2 to 4 or 5;

5th abdominal sternum membranous medially with 2 sternites; tyloids elongate-elliptical (Fig. 3), flattened on top and mat; apical transverse carina of propodeum distinctly higher than adjacent carinae; areola nearly trapezoidal--very elongate hexagonal. Similar to CALIFORNICUS, but latter with yellow front and middle femora and tibiae, tyloids linear and sharp, and 5th abdominal sternum complete with one sternite.

MALE DESCRIPTION. Black: Head, thorax, petiole except apex, variably on 2d abdominal tergum, apically on terga 4 to 6, abdomen tip, coxae, trochanters, at least basally on femora, often most of hind femur (Fig. 4), at least basally and apically on hind tibia.

Orange: Sometimes medially on hind tibia, most of front and middle femora except basally, front and middle tibiae, apex of petiole, variably on 2d abdominal tergum, and terga 4 to 6 except apices.

Punctuation: Dense to sparse (near vertex) with fine, more or less distinct pits on frons; sparse with more or less distinct pits on temple, propleurum, and mesopleurum except central area rugulose with denser punctuation; 2d abdominal tergum slightly mat.

Shape: Areola elongate hexagonal to nearly trapezoidal; area dentipara squarish to slightly elongate; 2d abdominal tergum nearly regularly trapezoidal; propodeal spiracle roundly elliptical; radial cell shortened; tyloids elongate-elliptical, flattened and mat on top.

Other: Apical transverse carinae of propodeum distinctly and evenly developed, much stronger than adjacent carinae; 5th abdominal sternum divided by membrane medially; ocelli small, distant from each other by more than the diameter of one; hind femur more swollen (than in CALIFORNICUS), depth over length .26 to .27 (length includes trochantellus).

FEMALE DIAGNOSIS. Small size, 5 mm long; black clypeus, petiole except tip, apically on abdominal terga 4-6 and all of apex, coxae, trochanters, and hind leg; blackish-yellow on front and middle femora; areola hexagonal, nearly square; radial cell short, radial sector beyond

areolet curved distinctly forward to join metacarpus.

FEMALE DESCRIPTION. Black: Head capsule except mandible, thorax (tegula variable), petiole except apex, apically on abdominal terga 4-6 and all of tip, coxae, trochanters, and hind leg.

Orange: Scape, flagellum (orange-ish), mandible, apically on petiole, and abdominal terga 2-6 except apices.

Blackish-yellow: Variably on front and middle femora.

Punctuation: Face variably dense to sparse with variably distinct pits, its surface shiny; frons irregularly, moderately sparse with vertex very sparse, pits shallow and sometimes obscure; temple sparse with very fine, shallow pits. propleurum and mesopleurum moderately dense to sparse with fine, distinct pits, their surface slightly rugulose.

Shape: Areola hexagonal-- nearly square; area dentipara narrowly trapezoidal with fine but distinct carinae; propodeal spiracle broadly elliptical (egg shaped); radial cell with vein beyond areolet distinctly curved forward to metacarpus.

RANGE. Oregon, Montana, Wyoming, and Colorado; collections June through early August.

HOLOTYPE. (Male) Oregon, Mary's Peak 4000 ft: August 7, 1965, C. Dasch (deposited in the C. Dasch collection, Muskingum College, Ohio).

PARATYPES. (20 males, 2 females, U.S.A.) COLORADO-- (1 male), #1637, C.F. Baker (USNM). MONTANA-- (2 males) Glacier Nat. Pk.: July 2, 4, 1973, C. Dasch; (4 males) Bozeman: June 30, July 7, 1973, R., B.&C. Dasch, July 6, 1973, C. Dasch. OREGON-- (1 male) Clackamas Co., 1 mi. W. Springwater: June 12, 1956, J.D. Lattin (OSU); (8 males) Mary's Peak, 4000 ft: August 7, 8, 1965, C. Dasch; (1 male) 35 mi. E. Prairie City: July 10, 1935, J. Schuh (OSU); (1 female) Willamette: May 29, 1930, T.R. Chamberlain (OSU). WYOMING-- (3 males, 1 female) Moran, Jackson Hole Bio. Sta.: August, 1964, H.E. & M.A. Evans (MCZ); Yellowstone Pk., Lake Camp: C.T. Brues (MCZ).

GLYPHICNEMIS VULGARIS, new species
(Fig. 8-9)

MALE DIAGNOSIS. Small, 5 to 6 mm long; white on front and middle coxae and all trochanters; black clypeus, most of hind coxa and hind femur (Fig. 9); abdomen mostly black on terga 4 to 7, and black with orange apically on terga 1 to 4; 7 (or 8) tyloids on flagellar segments 8 (or 9)-15 (Fig. 8). Resembles no other Nearctic species. Palearctic *CLYPEALIS* (Thomson) very similar but with yellow clypeus, orange hind coxa and femur, and only 5 distinct tyloids.

MALE DESCRIPTION. Black: Head capsule; thorax except tegula; petiole except apex; abdominal terga 1 to 4 except apical margins, and terga 5 to tip; front and middle coxae basally (blackish), most of hind coxa and hind femur, and basal and apical ends of hind tibia.

White: At least tips of front and middle coxae, and all trochanters.

Orange: Scape, tegula, often front and middle coxae (more infusate-orange) basally, usually tip of hind coxa and base of hind femur, hind tibia except base and apex, apical margins of abdominal terga 1 to 4, and sometimes most of terga 3 and 4.

Punctuation: Dense, fine, distinct pits on frons; moderately sparse, fine, distinct pits on temple; sparse, indistinct pits on propleurum and mesopleurum; 2d abdominal tergum slightly mat.

Shape: Petiole nearly parallel sided (slender); 2d tergum narrowed.

FEMALE DIAGNOSIS. Small, 5 to 6 mm long; pale front and middle coxae with mostly infusate hind coxa and hind femur; orange clypeus, sometimes only apically; abdomen with at least some black on terga 4 to 7; distinct, white annulus on flagellar segments 6 to 9 or 10, antenna black-white-black when viewed dorsally.

FEMALE DESCRIPTION. Black: Head capsule except all or most of clypeus; thorax except sometimes tegula infusate-orange; petiole except apex; at least some infuscation on abdominal terga 4 to 7, often laterally on terga 2 and 3; front and middle coxae often infusate-orange,

also hind femur, and tip of hind tibia.

Yellow: Often front and middle coxae and all trochanters.

Orange: Scape, clypeus except sometimes only apically; coxae and hind femur sometimes more orangish; hind tibia except apex; apex of petiole, and most of terga 2 and 3.

Punctuation: Frons with variably sparse, finely distinct pits; propleurum and mesopleurum with sparse, indistinct pits; temple with sparse, finely distinct pits.

Shape: Areola broadly hexagonal; postpetiole narrow, width only somewhat greater than length; carinae of propodeum reduced but distinct.

RANGE. Eastern North America from New York to West Virginia, westward to eastern British Columbia, Minnesota, and Colorado. Collections early June through late July.

HOLOTYPE. (Female) West Virginia, Bowden: June 7, 1980, C. Dasch (deposited in Dasch collection, Muskingum College, Ohio).

PARATYPES. (91 males, 33 females, U.S.A. and Canada) BRITISH COLUMBIA-- (1 female) Mt. Robson Prov. Pk.: July 23, 1977, B. & C. Dasch. COLORADO-- (1 male) Boulder Canyon: July 24, 1964, C. Dasch. MINNESOTA-- (2 males) Itasca Co., Grand Rapids, N.C. Exp. Sta.: June 26, July 26, 1973, (UM). NEW YORK-- (1 male) McLean Bogs: July 21, 1951, C. Dasch. OHIO-- (4 males) Otsego, McAllister Bio. Sta.: May 22-June 6, 1977, June 9, 18-28, 1982, June 26, 1976, C. Dasch. ONTARIO-- (3 males) Gloucester: July 5-7, 1977, (CNC).

PENNSYLVANIA-- (35 males, 11 females) Gaines: June 6, 29-July 1, 1980, C. Dasch, June 30, July 1, 1980, B. & C. Dasch. QUEBEC-- (1 male) Quebec City, 3 miles W.: August 4, 1981, C. Dasch. WEST VIRGINIA-- (37 males, 19 females) Bowden: June 4-7, 1980, C. Dasch; (7 males, 1 female) Dolly Soda Wild. Area: July 26, 1980, B. & C. Dasch. WISCONSIN-- (1 female) Merrill: July 30, 1980, C. Dasch.

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ABSTRACT

The Nearctic genus GLYPHICNEMIS Foerster is revised with a key to the species. Four species are recognized: 2 species, MANDIBULARIS (Cresson) and CALIFORNICUS (Cresson), are redescribed, and CALIFORNICUS is resurrected from synonymy with the former; 2 species, NIGRIFEMORUM and VULGARIS, are described as new.

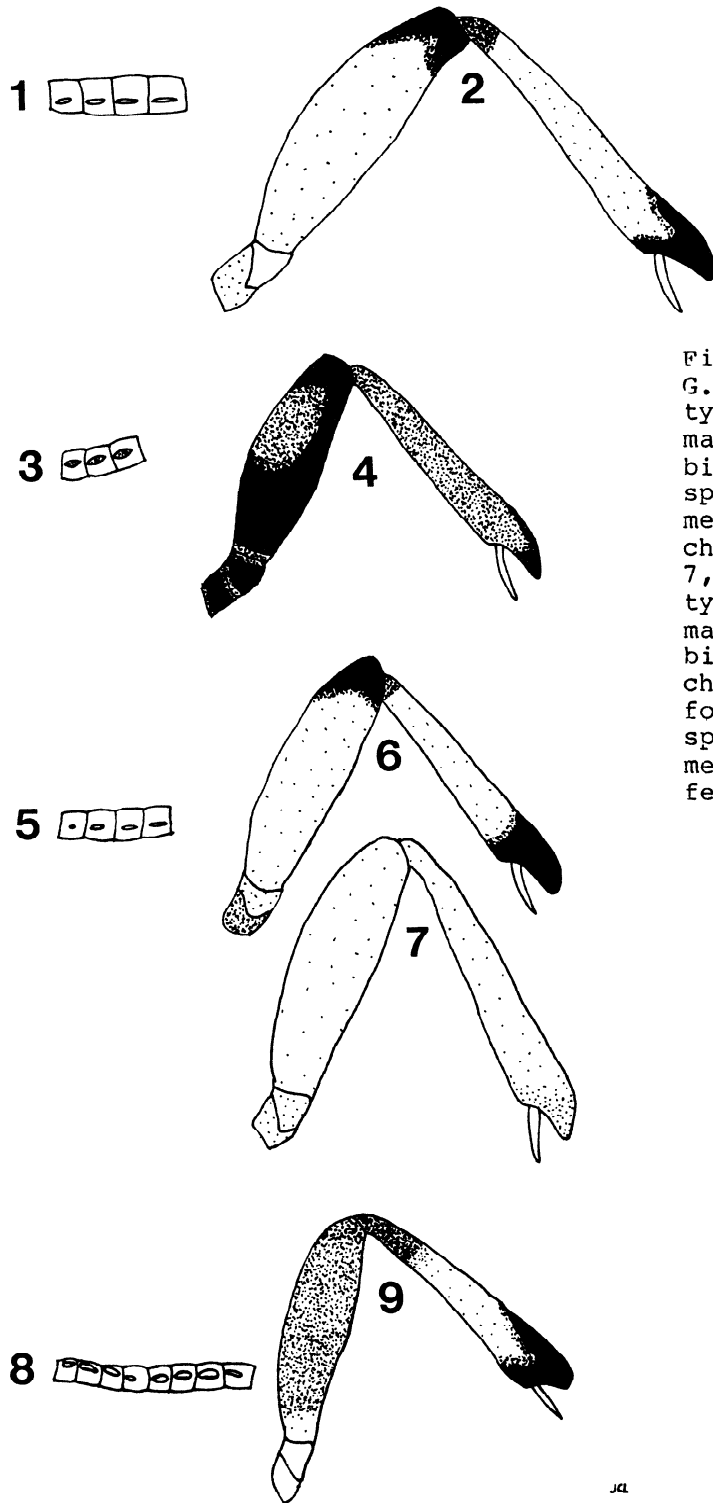


Fig. 1-9 *GLYPHICNEMIS* spp. Fig. 1-2, *G. MANDIBULARIS* (Cresson): 1, male tyloids, flagellar segments 10-13; 2, male hind trochanters, femur, and tibia. Fig. 3-4, *G. NIGRIFEMORUM*, n. sp.: 3, male tyloids, flagellar segments 10-12; 4, male hind trochanters, femur, and tibia. Fig. 5-7, *G. CALIFORNICUS* (Cresson): 5, male tyloids, flagellar segments 10-13; 6, male hind trochanters, femur, and tibia, (dark form); 7, male hind trochanters, femur, and tibia, (light form). Fig. 8-9, *G. VULGARIS*, n. sp.: 8, male tyloids, flagellar segments 8-15; 9, male hind trochanters, femur, and tibia.