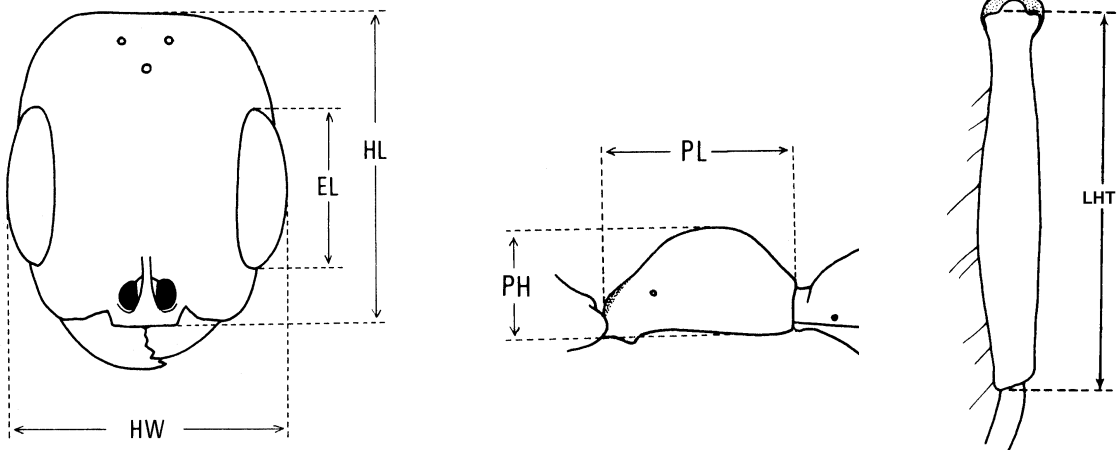


Provisional key to the species of *Pseudomyrmex* (Hymenoptera: Formicidae) of
Costa Rica, based on the worker caste

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This key covers the known *Pseudomyrmex* fauna of Costa Rica (55 species). The measurements and indices cited in this key are described below. All linear measurements are in millimeters. For additional details on these and other measurements see Ward (1989A, 1993, 1999B) or <http://entomology.ucdavis.edu/faculty/ward/psmetric.html>.

- HW Head width: maximum width of head, including the eyes
 HL Head length: midline length of the head excluding the mandibles, measured from the anterior clypeal margin to the midpoint of a line drawn across the posterior margin of the head
 EL Eye length: length of the compound eye, measured with the head in full-face view
 PL Petiole length: length of the petiole, measured in lateral view, from the lateral flanges of the anterior peduncle to the posterior extremity of the petiole
 PH Petiole height: maximum height of the petiole, measured in lateral view perpendicular to PL, but excluding any protruding anteroventral or posteroventral processes
 DPW Dorsal petiole width: maximum width of the petiole, measured in dorsal view
 LHT Metatibia length: length of the metatibia, excluding the proximomedial portion of the articulation with the metafemur



- CI Cephalic index: HW/HL
 REL Relative eye length: EL/HL
 REL2 Relative eye length, using head width: EL/HW
 PLI Petiole length index: PH/PL
 PWI Petiole width index: DPW/PL
 HTC Number of standing hairs, i.e., those forming an angle of 45° or more with the cuticular surface, visible in outline on the outer (extensor) surface of the metatibia
 MTC Equivalent count for mesotibia

Terms for surface sculpture follow Harris (1979). Species groups are those of Ward (1989A). Undescribed taxa are indicated with a code number (e.g., *Pseudomyrmex* PSW-33).

List of *Pseudomyrmex* species known from Costa Rica

***ferrugineus* group**

flavicornis (F. Smith, 1877B)
nigrocinctus (Emery, 1890C)
particeps Ward, 1993
spinicola (Emery, 1890C)

***gracilis* group**

browni Kempf, 1967C
faber (F. Smith, 1858A)
godmani (Forel, 1899F)
gracilis (Fabricius, 1804)
nigropilosus (Emery, 1890C)
osurus (Forel, 1911G)
sp. PSW-33
sp. PSW-36

***oculatus* group**

caeciliae (Forel, 1913M)
cretus Ward, 1989
cubaensis (Forel, 1901J)
eduardi (Forel, 1912H)
elongatus (Mayr, 1870A)
oculatus (F. Smith, 1855C)
urbanus (F. Smith, 1877B)

***pallens* group**

pallens (Mayr, 1870A)
sp. PSW-03
sp. PSW-53

***pallidus* group**

ejectus (F. Smith, 1858A)
euryblemma (Forel, 1899F)
pallidus (F. Smith, 1855C)
rochai (Forel, 1912H)
simplex (F. Smith, 1877B)
sp. PSW-04
sp. PSW-05
sp. PSW-06
sp. PSW-11
sp. PSW-12
sp. PSW-14

***sericeus* group**

beccarii (Menozzi, 1935B)
fortis (Forel, 1899F)
ita (Forel, 1906D)
lisus (Enzmann, 1944)
sp. PSW-55

***subtilissimus* group**

spiculus Ward, 1989
subtilissimus (Emery, 1890C)
tenuissimus (Emery, 1906C)

***tenuis* group**

boopis (Roger, 1863B)
tenuis (Fabricius, 1804)

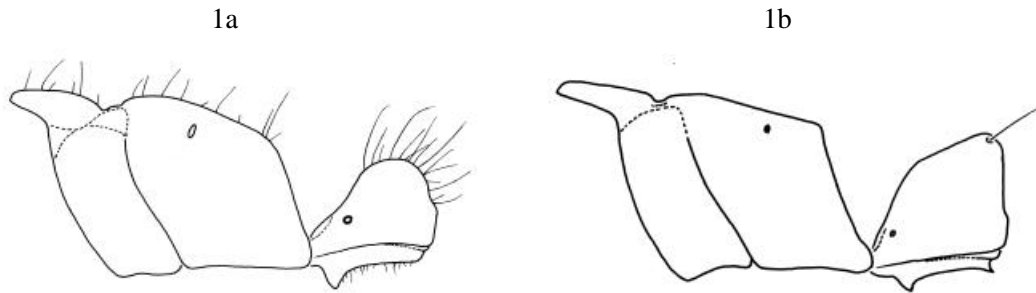
***viduus* group**

kuenckeli (Emery, 1890C)
viduus (F. Smith, 1858A)

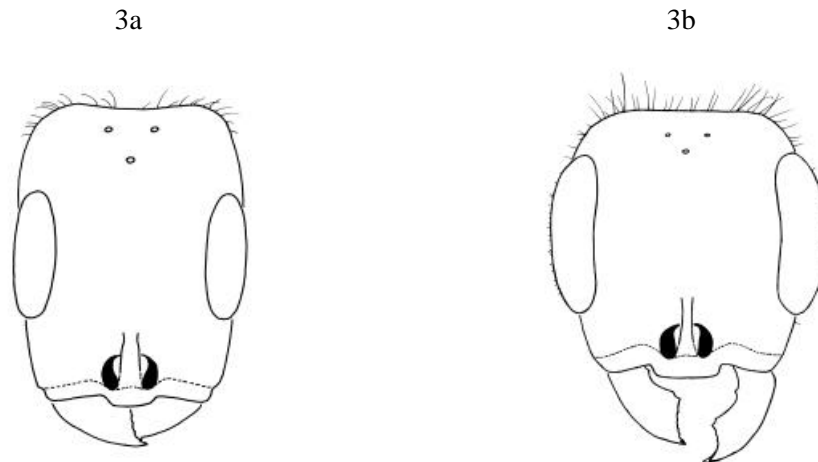
unplaced to species group

duckei (Forel, 1906D)
filiformis (Fabricius, 1804)
laevifrons Ward, 1989
oki (Forel, 1906D)
perboscii (Guérin-Méneville, 1844A)
subater (Wheeler & Mann, 1914)
sp. PSW-01
sp. PSW-02
sp. PSW-43
sp. PSW-52

Key to the *Pseudomyrmex* species of Costa Rica, based on the worker caste

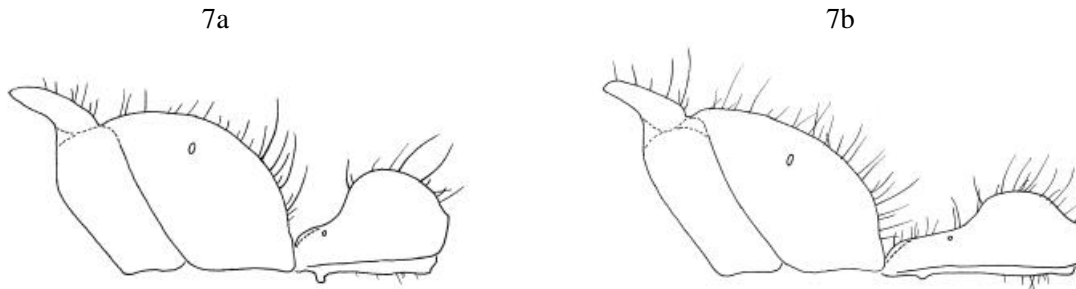


- 1a Standing pilosity moderately common to abundant on most parts of body, including mesonotum; more than ten standing hairs visible on the mesosoma dorsum in lateral view.....2
- 1b Standing pilosity sparse, absent from mesonotum; fewer than eight standing hairs on mesosoma dorsum, typically arranged as 1-2 and 0-1 isolated pairs on the pronotum and propodeum, respectively30
- 2a Standing pilosity common on the outer (extensor) surface of the mesotibia and metatibia, (HTC + MTC) > 10; the tibial hairs conspicuous and their maximum length subequal to, or greater than, the maximum dorsoventral width of the tibia3
- 2b Tibial pilosity sparse, (HTC+MTC) usually < 8 but if greater then hairs short, inconspicuous, and tending to grade into a background of appressed and subdecumbent pubescence..... 12



- 3a Eyes relatively short, less than half the head length (REL 0.39-0.48); petiole broad, maximum width three-quarters or more of length (PWI 0.73-1.40) (*viduus* group).....4
- 3b Eyes elongate, more than half the head length (REL 0.54-0.67); petiole usually long and slender, width rarely as much as three-quarters of the length (PWI 0.38-0.75) (*gracilis* group).....5
- 4 Both head and petiole broader than long, CI 1.08-1.16, PWI 1.08-1.40; eye length much less than head width (REL2 0.39-0.42).....*kuenckeli* (Emery)
- 4' Both head and petiole notably longer than broad, CI 0.70-0.79, PWI 0.73-0.92; eye length greater than or equal to head width (REL2 0.50-0.57) *viduus* (F. Smith)
- 5a Head very broad, CI 1.17-1.24; small, compact dark-colored species with relatively short and broad petiole (PWI 0.64-0.75).....6

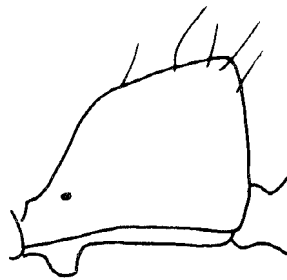
- 5b Head less broad, $CI < 1.10$; either petiole more elongate ($PWI < 0.60$) and/or body lighter in color ..7
- 6a Larger species, with very broad head ($HW > 1.90$, $CI \sim 1.24$); mesonotum and dorsal face of propodeum longitudinally costulate; posterior face of petiole overhanging the posterior peduncle.....
..... *browni* Kempf
- 6b Smaller species, with less broad head ($HW < 1.85$, $CI \sim 1.18$); mesonotum and dorsal face of propodeum punctulate; posterior face of petiole vertical, not overhanging the end of the petiole
..... *godmani* (Forel)



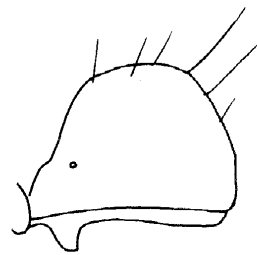
- 7a Petiole relatively short ($PLI 0.69-0.77$); workers in Costa Rican populations mostly concolorous orange; inhabitant of swollen-thorn *Acacia* *nigropilosus* (Emery)
- 7b Petiole more elongate ($PLI 0.38-0.57$); color and habits variable8
- 8a Entire body light orange-brown in color.....9
- 8b Entire body black, or bicolored with black head 10
- 9a Smaller species ($HW 1.31-1.52$), with subopaque head; petiole without a sharply differentiated anterior peduncle, as seen in lateral view *faber* (F. Smith)
- 9b Larger species ($HW 1.54-1.64$), with shiny head; petiolar node and anterior peduncle well differentiated, with a marked inflection between the dorsal face of the peduncle and the anterior face of the node (as seen in lateral view)..... *osurus* (Forel)
- 10a Petiole strikingly elongate ($PLI \sim 0.38$); head black and shiny, sparsely pubescent; at least part (usually most) of mesosoma and gaster a contrasting orange sp. PSW-36
- 10b Petiole less elongate ($PLI 0.46-0.57$); either head subopaque and conspicuously pubescent and/or body unicolorous black..... 11
- 11a Head sublucid; eyes and petiole relatively long compared with the metatibia ($EL/LHT 0.80-0.82$, $PL/LHT 0.81-0.82$); unicolorous black sp. PSW-33
- 11b Head subopaque; eyes and petiole shorter in relation to the metatibia ($EL/LHT 0.62-0.77$, $PL/LHT 0.63-0.77$); color variable, black or bicolored *gracilis* (Fabricius)
- 12a Median clypeal lobe laterally angulate; eyes elongate, more than one half head length ($REL > 0.50$) ..
..... 13
- 12b Median clypeal lobe rounded laterally, or if angulate (*P. spinicola*, an acacia-ant) then eyes shorter than one half head length ($REL 0.42-0.47$)..... 14
- 13a Small brown species, $HW < 0.90$ *oki* (Forel)
- 13b Larger black species, $HW > 1.00$ sp. PSW-02
- 14a Standing pilosity present on the proximal funicular segments and (as numerous rather short and inconspicuous hairs) on the outer surface of the mesotibia and metatibia; body pubescence thick and

- partly decumbent giving worker a “scruffy” appearance; small, brown species, with relatively short eyes (REL < 0.50) and a well developed anteroventral postpetiolar process
*subater* (Wheeler & Mann)
- 14b Without the preceding patterns of pilosity; if body pubescence conspicuously thick and decumbent then eyes more elongate (REL > 0.50) and anteroventral postpetiolar process not developed 15
- 15a Eyes elongate, about one half head length or more (REL 0.48-0.62); petiole relatively short and high (PLI 0.75-1.09); EL/PL 1.09-1.59; palp formula 6,3, reduced to 5,3 in the smallest species (HW < 0.68) (*oculatus* group) 16
- 15b Either eyes shorter (REL < 0.48) and/or petiole longer (PLI < 0.71); EL/PL usually less than 1.05; palp formula various, not 6,3 22

16a



16b



- 16a Petiolar node with a flat, posteriorly uplifted, dorsal face, rounding suddenly into a vertical posterior face; medium-sized species (HW 0.73-0.91) with broad head and elongate eyes (REL 0.55-0.62).....
 *oculatus* (F. Smith)
- 16b Dorsum of petiolar node broadly rounded in lateral profile, dorsal and posterior faces not strongly differentiated 17
- 17a Larger species, HW 0.85-0.98 *cretus* Ward
- 17b Smaller species, HW < 0.79 18
- 18a Punctures on dorsum of worker head and pronotum contiguous almost throughout, rendering the integument largely opaque; punctures on upper third of head separated by less than half their diameters, and without conspicuous shiny interspaces; HW 0.56-0.68, usually < 0.65
 *elongatus* (Mayr)
- 18b Dorsum of head and pronotum more extensively shiny or sublucid, at least some punctures separated by half their diameters or more; size variable 19
- 19a Front of head smooth and shiny with scattered fine punctulae; small (HW 0.50-0.57), dark brown shiny species *eduardi* (Forel)
- 19b Front of head shiny to subopaque, with coarser (0.01 to 0.02 mm in diameter) and denser punctures, separated by 0-4 diameters 20
- 20a Larger species (HW 0.65-0.78); at lower end of size range, profemur is relatively slender and eyes are relatively short (see Ward, 1989A: figures 28, 29) *cubaensis* (Forel)
- 20b Smaller species (HW 0.51-0.66); at upper end of size range profemur tends to be broader and eyes longer 21
- 21a Larger species (HW 0.58-0.66); light brown in color *urbanus* (F. Smith)
- 21b Smaller species (HW 0.51-0.61, usually < 0.59); medium to dark brown in color *caeciliae* (Forel)

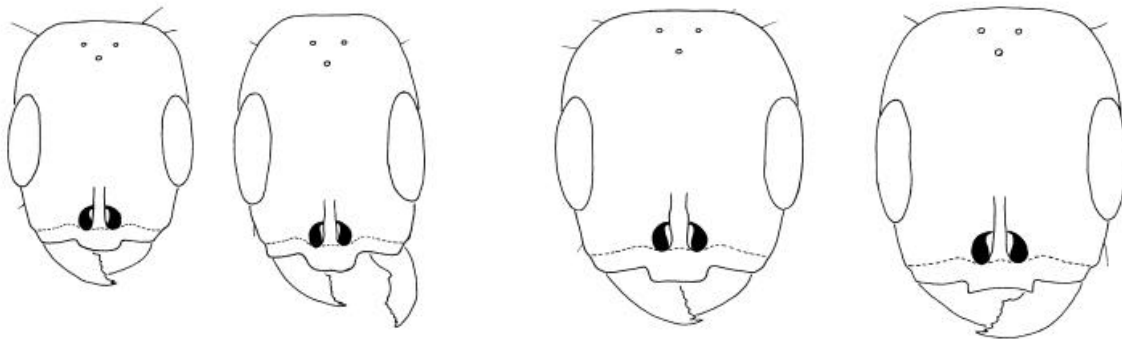
- 22a Head sublucid to lucid; sculpture on upper third of head between ocelli and compound eye consisting of scattered minute or medium-sized punctures separated by their diameters or more, the interspaces smooth, shiny and unsculptured 23
- 22b Head opaque to sublucid, sculpture consisting of contiguous punctulae (separated by less than their diameters) or with punctulae separated by coriarius sculpture, smooth shiny interspaces more or less lacking..... 26
- 23a Eyes shorter than one half head length (REL 0.44); posterior face of petiolar node sloping steeply, at an angle of more than 45° with the horizontal..... sp. PSW-43
- 23b Eyes longer than one half head length (REL 0.55); posterior face of petiolar node sloping gently from the summit, at an angle of no more than 45° with the horizontal..... 24
- 24a Head elongate (CI < 0.80), punctulae minute and inconspicuous, even under 50X magnification *filiformis* (Fabricius)
- 24b Head broader (CI > 0.80), with larger, conspicuous punctures..... 25
- 25a Smaller species (HW < 0.80); clypeal lobe with a marked dorsomedial protrusion, conspicuous in a lateral view of the head..... sp. PSW-52
- 25b Larger species (HW > 0.82); clypeal lobe lacking a conspicuous dorsomedial protrusion *duckei* (Forel)
- 26a Moderately large (HW > 1.00), orange species; frontal carinae closely contiguous, their minimum separation much less than basal scape width; head sculpture consisting of punctulae separated by subopaque, coriarius interspaces; nesting in dead twigs..... *pallens* (Mayr)
- 26b Frontal carinae less closely contiguous, separated by about basal scape width; head sculpture predominantly punctulate, without intervening coriarius interspaces; color and size variable; inhabiting swollen-thorn acacias (*ferrugineus* group)..... 27

nigrocinctus

particeps

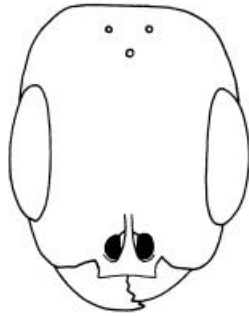
flavicornis

spinicola

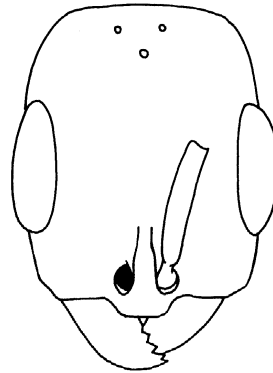


- 27a Smaller species (HW 0.74-0.85), with relatively narrow head; CI 0.75-0.84 28
- 27b Larger species (HW 0.94-1.21), with broader head; CI 0.83-0.97..... 29
- 28a Light orange-brown in color, with a fuscous patch on anterior third of abdominal tergite IV (first gastric tergite); eyes relatively short (EL/LHT 0.56-0.61) *nigrocinctus* (Emery)
- 28b Dark brown in color; eyes longer (EL/LHT 0.59-0.64)..... *particeps* Ward
- 29a Median clypeal lobe laterally angulate; light to dark brown in color..... *spinicola* (Emery)
- 29b Median clypeal lobe laterally rounded; predominantly black in color..... *flavicornis* (F. Smith)

30a

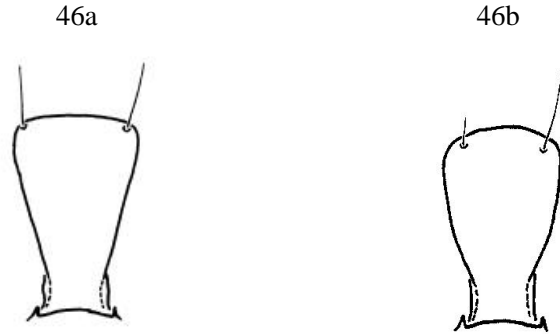


30b



- 30a Median clypeal lobe laterally angulate 31
- 30b Median clypeal lobe laterally rounded 43
- 31a Frontal carinae closely contiguous and forming a thin anterodorsally elevated ridge, not fusing with the antennal sclerites anteriorly; dorsal and declivitous faces of the propodeum meeting at a sharp angle or forming a pair of small lateral protuberances 32
- 31b Frontal carinae variably separated, not forming an anterodorsally elevated ridge, fusing with the antennal sclerites anteriorly; dorsal and declivitous faces of propodeum rounding into one another or meeting at a blunt angle, without forming lateral protuberances (*pallidus* group) 33
- 32a Small species (HW 0.48-0.56); front of head between compound eyes smooth, shiny, punctulate.....
..... *laevifrons* Ward
- 32b Larger species (HW > 0.70); front of head between compound eyes densely punctulate, subopaque to opaque..... sp. PSW-01
- 33a Metanotal groove deeply impressed; dorsal face of propodeum rounding gradually into the declivitous face, subequal to or less than the latter in length; head and gaster usually dark brown to black 34
- 33b Metanotal groove weakly impressed and/or dorsal face of propodeum notably longer than the declivitous face; color variable 35
- 34a Head shiny, middle third with scattered fine punctulae separated by several diameters or more, the interspaces smooth or weakly coriaceous; dorsal face of propodeum much shorter than declivitous face; pubescence sparse on abdominal tergite IV, most hairs separated by their lengths or more
..... sp. PSW-14
- 34b Head more densely sculptured and less shiny; punctures on middle third of head denser and larger, separated by one to several diameters, interspaces more coarsely coriaceous; dorsal face of propodeum not much shorter than declivitous face; pubescence on abdominal tergite IV tending to be denser, hairs often separated by less than their lengths.....*ejectus* (F. Smith)
- 35a Abdominal tergite IV sparsely pubescent and shiny, the appressed hairs separated by their lengths or more..... 36
- 35b Abdominal tergite IV moderately to densely pubescent, sublucid or subopaque, appressed hairs separated by less than their lengths 38

- 36a Predominantly orange or yellow-orange in color (may be black spots at base of gaster)
.....*simplex* (F. Smith)
- 36b Darker in color, at least gaster and usually also head predominantly dark brown to black 37
- 37a Summit of petiolar node occurring in the posterior third of petiole length, the convex posterior face
of node sloping much more steeply than the inflected anterodorsal face; petiole height equal to, or
greater than, maximum profemur width *rochai* (Forel)
- 37b Summit of petiolar node in middle third of petiole length, with convex posterior and anterior faces
sloping gradually downward from the summit; petiole height less than profemur width ... sp. PSW-11
- 38a Predominantly orange or yellow-orange in color (base of gaster may be infuscated) 39
- 38b At least gaster and part of mesosoma dark brown 42
- 39a Metanotal groove conspicuously impressed; petiole thin; upper third of head between ocelli and
posterior margin of compound eye with scattered, fine punctures on a smooth, shiny background.....
..... sp.PSW-04
- 39b Metanotal groove shallower; petiole broader; upper third of head with fine punctures, the interspaces
at least weakly coriarius, not completely smooth and shiny 40
- 40a Larger species, HW ≥ 0.82 ; head broader, CI 0.84-0.91 sp. PSW-06
- 40b Smaller species, HW ≤ 0.82 ; head tending to be less broad, CI 0.77-0.88 41
- 41a Dorsal face of propodeum rounding into declivitous face; eye relatively short, REL 0.46-0.54, REL2
0.56-0.65 [male paramere: caudal end consisting of a large lobe, not preceded by a smaller spine].....
..... *pallidus* (F. Smith)
- 41b Juncture between dorsal and declivitous faces of propodeum more angulate; eye more elongate, on
average, REL 0.52-0.58, REL2 0.64-0.68 [male paramere: caudal end consisting of a large lobe,
preceded by a small spine] sp. PSW-05
- 42a Smaller species, HW < 0.70 sp. PSW-12
- 42b Larger species, HW > 0.80*euryblemma* (Forel)
- 43a Masticatory margin of mandibles with 8-10 teeth or denticles; body covered with a very fine
appressed pubescence which gives the integument a silky appearance; eyes very long (REL > 0.55);
petiole short, high, and broad (*sericeus* group) 44
- 43b Masticatory margin of mandibles with 5-6 teeth; without the combination of other characters 48
- 44a Dorsal face of propodeum rounding gradually into declivitous face; petiolar node subtriangular in
profile, dorsally rounded, and lacking erect setae; head broad (CI ≈ 0.90)*beccarii* (Menozzi)
- 44b Dorsal face of propodeum usually meeting declivitous face at an angle; petiolar node globular or
subquadrate in lateral view, usually with a pair of erect setae; head less broad (CI < 0.90) 45
- 45a Large species (HW 0.96-1.15), with elongate head (CI 0.81-0.86) and relatively short eyes (REL
0.57-0.59); petiole broad and subglobose, with a prominent anteroventral process*fortis* (Forel)
- 45b Eyes longer (REL > 0.60), size and head shape variable; petiole somewhat angular in profile,
anteroventral process less prominent..... 46



- 46a Petiolar node sharply margined laterally; in dorsal view lateral margins of petiole more or less straight and rounding sharply into the posterior margin; size intermediate, HW 0.85-0.97...*ita* (Forel)
- 46b Petiolar node with lateral margins more rounded; in dorsal view lateral and posterior margins more convex, posterolateral corners gently rounded; usually falling outside the above size range..... 47
- 47a Smaller species, HW < 0.85.....*lisus* (Enzmann)
- 47b Larger species, HW > 0.95..... sp. PSW-55
- 48a Small species (HW < 0.67) with elongate head (CI 0.56-0.71); frontal carinae subcontiguous and raised anterodorsally, not fusing with the antennal sclerites (*subtilissimus* group)..... 49
- 48b Larger species (HW > 0.80) with broader head (CI > 0.74); frontal carinae not raised anterodorsally, fusing anteriorly with the antennal sclerites..... 51
- 49a Very small species (HW 0.48-0.53), with elongate head (CI 0.56-0.62) and slender petiole (PLI 0.54-0.66)..... *tenuissimus* (Emery)
- 49b Larger species (HW 0.55-0.66), with broader head (CI 0.60-0.71); if worker HW < 0.60, then petiole generally rather short (PLI 0.65-0.75)..... 50
- 50a Smaller species (HW 0.55-0.59), with more elongate head (CI 0.60-0.65) and with relatively short petiole (PLI 0.65-0.75).....*subtilissimus* (Emery)
- 50b Larger species (HW 0.61-0.66), with broader head (CI 0.66-0.71) and more slender petiole (PLI 0.56-0.67).....*spiculus* Ward
- 51a Head smooth, shiny, with scattered fine punctulae; metanotal groove deeply impressed.....*perbosci* (Guérin-Méneville)
- 51b Head subopaque to opaque, with densely punctulate or punctulate-coriarius sculpture; metanotal groove moderately impressed or absent..... 52
- 52a Head broad (CI 0.93-1.00) with large, elongate eyes, more than one half head length (REL > 0.60) (*tenuis* group)..... 53
- 52b Head less broad (CI < 0.85), eyes less than one half head length (REL < 0.49)..... 54
- 53a Dorsal face of petiole strongly differentiated from the vertical posterior face, and meeting the latter at a very sharp (acute) angle, the juncture between the two marked laterally by a pair of blunt teeth....
.....*tenuis* (Fabricius)
- 53b Dorsal face of petiole not differentiated from the posterior face, rounding insensibly into it
..... *boopis* (Roger)
- 54a Orange with transverse fuscous bands on the gaster; metanotal groove not impressed sp. PSW-53
- 54b Head and gaster dark brown; metanotal groove moderately impressed sp. PSW-03

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