

**GONIOMMA KUGLERI, A NEW GRANIVOROUS ANT FROM THE IBERIAN
PENINSULA (HYMENOPTERA: FORMICIDAE)**

XAVIER ESPADALER

*Departamento de Zoología, Universidad Autónoma de Barcelona,
Bellaterra, Barcelona, Spain*

ABSTRACT

**The ant *Goniomma kugleri* n.sp. is described from the Iberian Peninsula. Descriptions are given for workers, females and males. The species is morphologically related to *G. blanci* (Andre). Some observations are given on the biology of this new species.
KEY WORDS: *Formicidae*, *Goniomma kugleri* n.sp., Spain.**

INTRODUCTION

Eleven taxa have been described in the mediterranean genus *Goniomma* Emery 1895 (Espadaler, 1981; Donisthorpe, 1950), but much needed revision would surely reduce this number to 5-6 good species. The three castes are known for only two species, namely *G. blanci* (Andre) and *G. hispanicum* (Andre). *G. blanci* is well characterized and fairly distinct from the rest because of its eyes which are positioned near the clypeal margin, close to the mandibular base. The occurrence of workers of a similar species with such characteristic eyes was first recorded in autumn 1974 in Donana (Huelva, Spain), and since then they have been found in several localities in the Iberian Peninsula. However, the winged forms became available only in 1982, and so this new species can now be properly described.

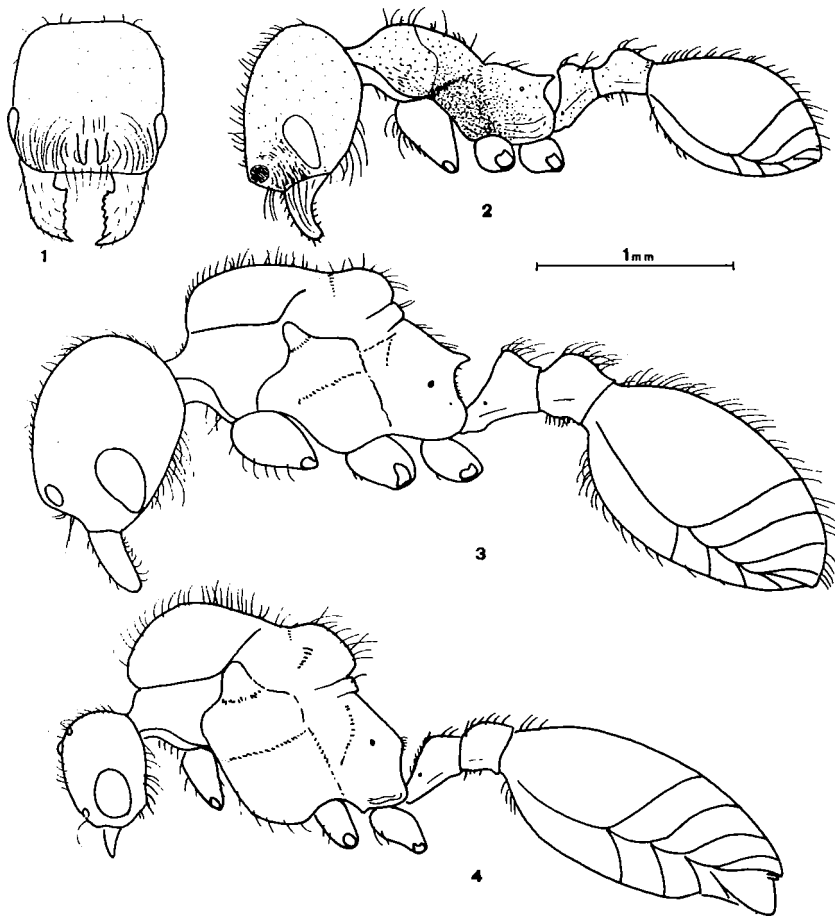
Goniomma kugleri **Espadaler, n.sp.**
(Figs. 1-15)

(*G. maurum*, sensu Espadaler, 1981; misidentification)

(*G. blanci*, sensu Tinaut, 1981 and Rodriguez, 1982; misidentification)

Worker (Figs. 1,2,7,8,11)

Length 2.8-3.4 mm (measures on 20 workers). Colour dark brown; mandibles legs, antennae and tip of frontal laminae brownish; young individuals with alitrunk reddish brown. Head longer than wide; HI (head width behind eyes X 100/head length) = 93.33-96.60-100.00 (s=1.91) (minimum-mean-maximum); shining with alutaceous microsculpture; sometimes occiput smooth; space between eyes and antennal fossa with very superficial striae, also present in the front in the bigger specimens. Frontal area smooth and shining. Scape not reaching occiput; head length/scape length = 1.26-1.29-1.42 (s=0.03); SI (scape length X 100/head width) =



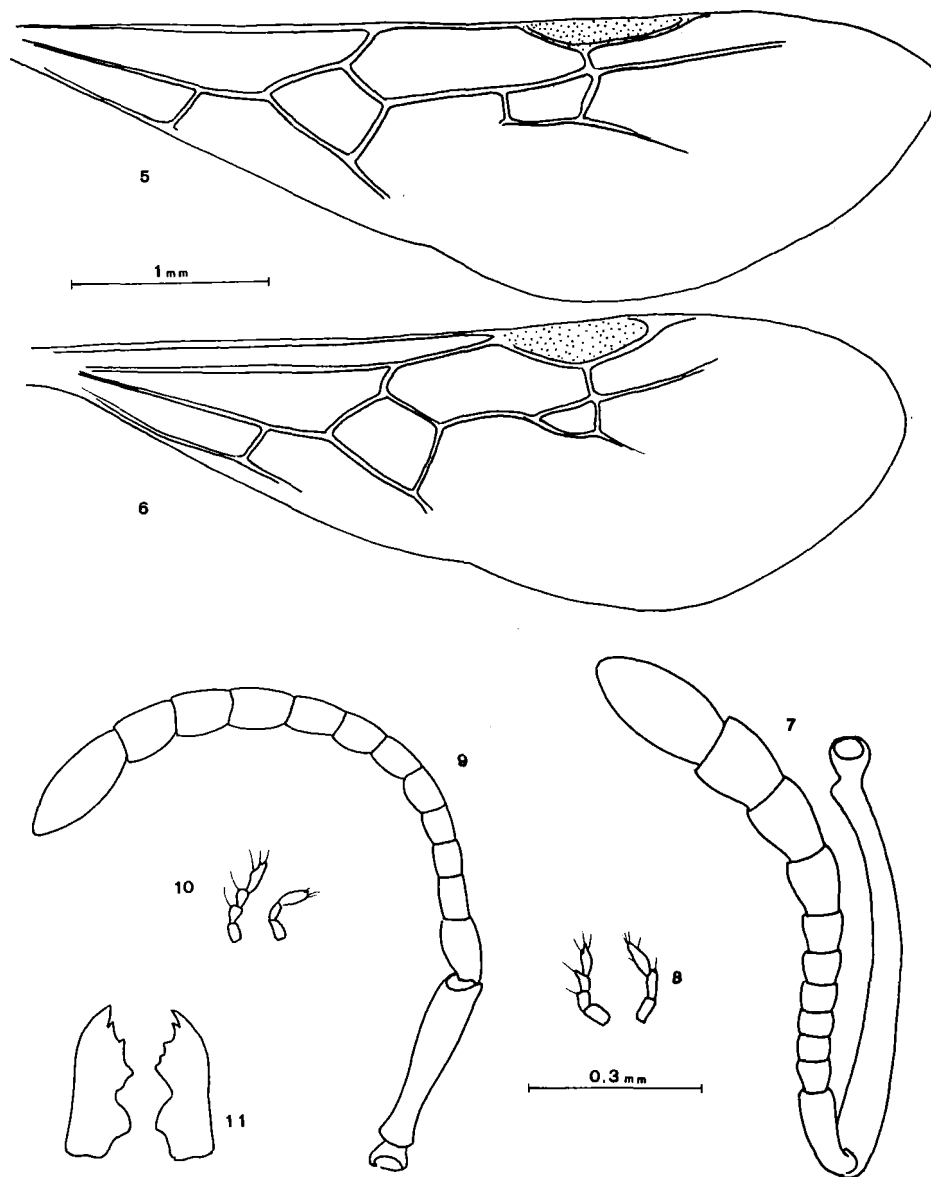
Figs. 1-4. *Goniomma kugleri* n.sp. 1. ♀, head, frontal view, 2. ♀, side view. 3. ♀, side view, sculpture omitted, 4. ♂, side view, sculpture omitted.

75.00-79.89-82.75 ($s=1.75$); occiput in full dorsal view straight or slightly concave; eyes large (0.24-0.30 mm), curved and positioned near the mandibular base, with micropilosity of 0.015 mm; mandibles with 7-8 teeth; basal directed somewhat inwards; 5-6 following teeth subequal and apical longer than the rest. Antennae with 12 segments; first funicular segment twice as long as wide; following 2-7 funicular segments as long as wide; the rest, forming a club; apical segment twice as long as wide. Palp formula 4:3.

Thorax shining; pronotum with dorsal surface with alutaceous microsculpture, its sides with extremely fine irregular striae; mesonotum and propodeum alutaceous dorsally, with sides reticulate to longitudinally rugose; space between spines smooth and shining. Length of alitrunk (Weber's length)/pronotum width = 1.90-2.00-2.05 ($s=0.04$). Buschinger's index = 1.33-1.42-1.60 ($s=0.08$). Metasternum with a small but sharply pointed process. Petiole and postpetiole shining, almost smooth; petiole width/petiole height = 0.65-0.68-0.73 ($s=0.02$). Postpetiole rounded from above; postpetiole width/postpetiole height = 1.05-1.11-1.25 ($s=0.05$). Gaster shining, with

very fine alutaceous microsculpture.

Suberect and subdecumbent yellowish hairs on gaster, petiole, postpetiole and alitrunk; decumbent and appressed hairs on head and legs; gula with 10-12 long curved hairs arranged in a psammophore plus other small appressed hairs. A fringe of long hairs at the anterior border of the clypeus.



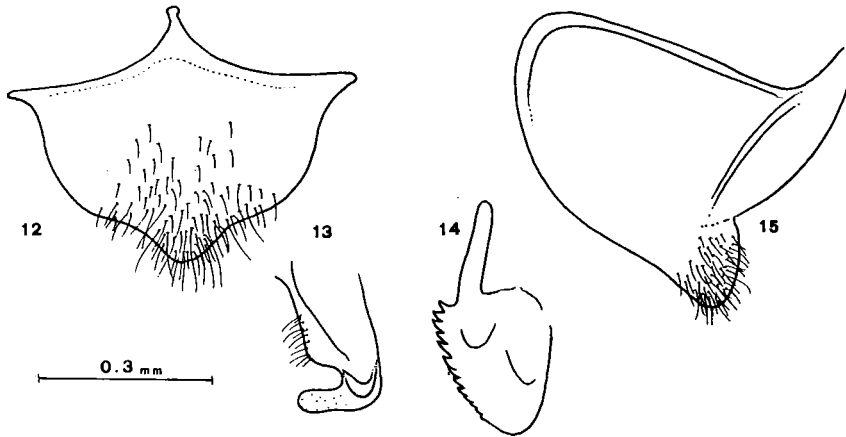
Figs. 5-11. *Goniomma kugleri* n.sp. 5. ♀, forewing, 6. ♂ forewing, 7. ♀, antenna, pilosity omitted, 8. ♀, bucal palps. 9. ♂, antenna, pilosity omitted, 10. ♂, bucal palps, 11. ♀, mandible, two examples.

Female (Figs. 3, 5)

Length 4.2-4.3 mm (measures on 10 females). Body dark brown with mandibles, smaller funicular segments, tip of frontal laminae and junctures of petioles and legs reddish brown. Cephalic structure as in workers but insertion points of hairs more marked. Antennae, clypeus, eyes and occiput as in workers. Mandibles with 8-9 teeth, the apical comparatively more developed than in workers. HI = 102.63-104.78-107.89 (s=1.41); scape reaching posterior ocelli; SI = 67.50-69.43-71.79 (s=1.43); head length/scape length = 1.33-1.37-1.40 (s=0.02); eyes 0.32-0.35 mm length; palp formula 4:3.

Pronotum superficially reticulate in the middle, striated to reticulate at its sides, not concealed above by the mesonotum; mesoscutellum with a middle line narrowing posteriorly smooth and shining without hairs; the rest alutaceous to rugose longitudinally, with hair punctures. Middle of scutellum unsculptured; mesopleurae shining with longitudinal striae that are continued at the basal part of propodeum; dorsum of propodeum smooth to finely striated transversally, smooth between spines. Forewing length: 4.9-5.1 mm.

Petiole and postpetiole submatt; petiole width/petiole height = 0.71-0.76-0.77 (s=0.01); postpetiole more transverse than in workers; postpetiole width/postpetiole height = 1.11-1.14-1.15 (s=0.01). Gaster and pilosity as in the workers. Wings with two cubital cells, one discoidal and one open radial; second cubital surface one third or less than first cubital surface.



Figs. 12-15. *Goniomma kugleri* n.sp. 12, subgenital plate, 13, volsella, 14, aedeagus, 15, external paramera.

Male (Figs. 4, 9, 12-15)

Length 2.9-3.5 mm (measures on 10 males). Blackish brown except tarsi and funiculus that are brown. Head longer than wide; HI = 90.90-94.46-96.65 (s=1.53); head shining; occiput with alutaceous microsculpture, passing to finely rugose at the front with some very superficial striae surrounding the antennal fossa; frontal area smooth and shining; scape hardly reaching posterior ocelli; SI = 57.89-60.37-63.41

($s=1.50$); head length/scape length = 1.65-1.75-1.83 ($s=0.05$); scape as long as the first 4.5 funiculus segments. Mandibles with 3-5 teeth. Palp formula 4:3. Clypeus straight in dorsal view. Eyes with micropilosity of 0.03 mm.

Pronotum shining, alutaceous but in some cases completely smooth; mesonotum with a medial anterior zone smooth, hairless; some longitudinal striae and parapsidal zone smooth; mesoscutellum smooth in the middle, striated longitudinally at its sides; mesopleurae in great part smooth, with some fine longitudinal striae; katapisternum with a maximum of 32 setae not longer than 0.18 mm; propodeum bluntly angled, reticulate to rugose longitudinally at its sides, smooth and shining at its dorsal face. Metasternum with a poorly developed spine.

Petiole and postpetiole smooth dorsally, very finely reticulate at its sides; petiole width/petiole height = 0.82-0.88-0.94 ($s=0.04$); postpetiole width/postpetiole height = 1.22-1.34-1.44 ($s=0.09$). Gaster smooth and shining. Wings as in the female but second cubital cell comparatively smaller.

Genitalia. Subgenital plate triangular lobulated with some 80 hairs; external paramera with 45-55 hairs; aedeagus with 12-15 teeth; digital lobe of volsella curved, with 14-17 areolae; cuspidal lobe very short; ventral border of volsella with 10-12 setae.

MATERIAL EXAMINED: Holotype ♀, Spain, Castro y Picón (Córdoba), 13-IX-1982, X. Espadaler. 39 paratypes (10 ♀♀, 10 ♀♀ and 10 ♂♂) same data as holotype. Additional paratypes: Spain, 3 ♀♀, Coto de Donaña (Huelva), IV-1976, C.A. Collingwood, 2 ♀♀, Coto de Donaña (Huelva), 30-XI-1974, X. Espadaler; 2 ♀♀, Villaviciosa de Córdoba (Córdoba), 18-VI-1979, A. Rodriguez; 4 ♀♀, Embalse de Quentar (Granada), 3-XII-1978, A. Tinaut; 2 ♀♀, Nogueira (Pontevedra), VII-1979, C.A. Collingwood; 2 ♀♀, Castro y Picón (Córdoba), 5-X-1980, A. Rodriguez. Holotype in author's collection; one worker, one female and one male in each of the following institutions: Departamento de Zoología, Universidad Autónoma de Barcelona; Muséum National d'Histoire Naturelle, Paris; Muséum d'Histoire Naturelle, Genève; Naturhistorisches Museum, Basle; Museum of Comparative Zoology, Harvard.

The species is dedicated to Prof. J. Kugler who helped in getting the winged forms and for his example of enthusiastic and fine work on ants.

AFFINITIES

Goniomma kugleri is similar to *G. blanci* (André) by the characteristic position of the eyes, nearly touching the mandibular base. *G. kugleri*, in the three castes, looks at first glance like a small *G. blanci*. Body sculpture in *G. kugleri* workers is less developed, specially on the head. In *G. blanci* the head is wider: HI = 100.00-103.86-106.49 ($s=1.96$; $n=15$); SI = 70.73-73.84-76.31 ($s=1.59$); the scape, in its proportions relative to head length, is very similar in both species; head length/scape length = 1.26-1.30-1.33 ($s=0.01$); thoracic, petiolar and postpetiolar proportions are very alike.

In the females the main differences are the less developed sculpture in *G. kugleri* and the smaller cubital cell. *G. blanci* females are larger, from 4.9 to 5.2 mm and the wings are longer, from 5.9 to 6.4 mm (Espadaler & Muñoz, 1979). HI and SI are

similar and also head length/scape length. Petiolar proportions are also different: in *G. blanci* females, petiole width/petiole height = 0.67-0.70-0.73 (s=0.03); postpetiole width/postpetiole height = 1.08-1.09-1.11 (s=0.01).

Males also differ by the smaller size: 2.9-3.5 mm in *G. kugleri* compared with 3.5-3.7 mm in *G. blanci* (Espadaler, 1984); HI is similar in both species but the scape is longer in *G. blanci* where it is as long as the first 5 funiculus segments; SI in *G. blanci* is 63.04-66.51-69.56 (s=2.31); head length/scape length in *G. blanci* is 1.50-1.58-1.65 (s=0.05). Body sculpture is less developed in *G. kugleri* and the second cubital cell is also smaller in this last species.

BIOLOGICAL OBSERVATIONS

One nest found at Castro y Picón (Córdoba, Spain) was excavated. It was situated on a shrub southern slope of a schistous mountain with *Pinus halepensis*, *Myrtus communis*, *Cistus ladanifer*, *Phyllirea angustifolia* and some sparse *Quercus ilex* and *Quercus coccifera*. Granaries were found at a depth of 10 cm and consisted, at that time (13-IX-1982) exclusively of seeds of *Cistus ladanifer*. Chambers with larvae and naked pupae were found at some 35-40 cm depth. No queen was recovered. Some winged females were found at the granaries but a great number of winged males and females were found at a greater depth. In artificial nests some winged females and males died before winter but the majority lived there until the next season, after hibernating 4 months. Six winged females lived about two more years and passed through two other periods of hibernation. In march 1985 all the colony was preserved in alcohol. Foraging was individual both at the field and laboratory. The excavated nest contained a minimum of 360 workers, 40 females and 39 males.

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REFERENCES

- Donisthorpe, H. 1950. Two new species of ants from Turkey. *Entomologist's Record* 61:60-61.
- Espadaler, X. and J. Muñoz. 1979. *Goniomma blanci* (André, 1881): descripción de la hembra. *Boletín de la Asociación española de Entomología* 3:11-15.
- Espadaler, X. 1981. Les formigues granívores de la Mediterrània occidental. *Treballs de l'Institut Catalana d'Historia Natural* 9:39-44.
- Espadaler, X. 1984. *Lepthothorax nadigi* Kutter, 1925 y *Goniomma blanci* (André, 1881): descripción de los machos. *Boletín de la Asociación española de Entomología* 8:135-141.
- Rodríguez, A. 1982. Contribución al conocimiento de las hormigas (Hymenoptera, Formicidae) de Sierra Morena Central. *Boletín de la Asociación española de Entomología* 5(1981): 181-188.
- Tinaut, A. 1981. Estudio de los Formícidos de Sierra Nevada. Thesis, Universidad de Granada.