

CONFIRMATION OF THE PRESENCE OF *LAMYCTES AFRICANUS* (PORATH, 1871) IN FRANCE (CHILOPODA, LITHOBIOMORPHA: HENICOPIDAE)

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ABSTRACT

After a review of specimens of the genus *Lamyctes* found in flowerpots from a garden in Arles (Bouches-du-Rhône department) during the year 2006, the species *Lamyctes africanus* (Porath, 1871) is confirmed in France. Its main determining characters are detailed and illustrated.

RÉSUMÉ

Suite à un réexamen de spécimens du genre *Lamyctes* trouvés dans des pots de fleurs d'un jardin à Arles (Bouches-du-Rhône) en 2006, l'espèce *Lamyctes africanus* (Porath, 1871) est confirmée en France. Ses principaux caractères déterminants sont détaillés et illustrés.

INTRODUCTION

Ten years ago, we collected some tens of Lithobiomorpha in a garden at Pont de Crau, a locality in the city of Arles (Bouches-du-Rhône department, France). Amongst these centipedes, twenty-three females coming from flowerpots had been identified as *Lamyctes emarginatus* (Newport, 1844) (Iorio & Berg, 2007). *L. emarginatus* is a species from the family Henicopidae, which is predominantly a southern hemisphere group. It is an invasive and pioneer species well distributed in France and elsewhere in Europe; it is frequently found in made-made habitats and parthenogenetic in France and almost in all Europe (Zapparoli, 2010; Iorio, 2014). In one of our notebooks dedicated to the provisional writing up of our inventories and identifications as well as of possible remarks and of morphological details, we had taken some notes on these *L. emarginatus* during our past examination. We had noticed that curiously, adult specimens had 25 to 29 antennal articles, mainly 28-29, instead of the usual number of 25 for this species. But we had not made researches on this subject, because of the inconstant number of articles as well as the fact that there were only two known French species in the genus *Lamyctes* (the other being the anophthalmous *L. coeculus* (Brölemann, 1889), easily distinguished and only known in greenhouses of the Muséum national d'Histoire naturelle of Paris).

Recently, but unfortunately after the completion of our catalogue of French centipedes (Iorio, 2014), we have read the paper of Enghoff *et al.* (2013), who have discovered *Lamyctes africanus* (Porath, 1871) in several localities from Denmark. These authors have also included a useful redescription and a key of European species of the genus concerned. Reading their description and key we remembered notes about the number of articles of our previously examined *Lamyctes* from Arles. We thus have re-examined all the specimens concerned and the aim of this article is to give some details of the results our examinations which allow us to confirm the presence of *L. africanus* in France.

MATERIAL AND METHODS

Our personal collection of *Lamyctes* as well as of our other Chilopoda is preserved in 70% ethanol in our office in the city of Rougé (Loire-Atlantique department, France). We have examined all the specimens of the tube labelled *Lamyctes emarginatus* (Newport, 1844) – Arles (13), Pont-de-Crau,

jardin d'une maison, dans une pelouse et des pots de fleurs, environ 10 m d'altitude, 23.X.2006, réc./dét. E. Iorio, with a trinocular lens (7.5x to 50x), secondarily with a microscope (40x to 400x). The paper of Enghoff *et al.* (2013) has been used as the main basis for identification, but some other works have been consulted; e.g. Porath (1871), Attems (1928) and Iorio (2010). Measurements have been taken with 0.1 and 0.01 mm graduated scales. Magnified pictures have been made with a digital camera on the trinocular lens and stacking of several photographs with the *Combine ZP* software.

RESULTS OF OUR REVISION

We have found that all adult females from Arles (= ten) unambiguously correspond to the hemicopid *Lamyctes africanus* as described by Enghoff *et al.* (2013) and also by Porath (1871) and Attems (1928); the thirteen other specimens, younger, being assigned to the same species using their criteria (even if some antennae are not fully developed). We note the writing of the author of *L. africanus*, originally described as *Henicops Africana* Porath, 1871 is correct with an "h" at the end, as is written on the original paper (Porath, 1871).

The main diagnostic criteria of the ten adult females of our material are detailed below:

Habitus: the colour of adult specimens is mainly bright orange with yellow to orange antennae and legs, with the bases of antennae darker up to their median and distal parts. They have black markings not only around the pale eyes but in several cases: the dark colour is present on the major part of the cephalic shield (Fig. 1). The colour of our specimens could have been degraded by ten years in 70% ethanol.

Body-length: the body-length reach 8 to 8.9 mm without antennae and legs. Our smaller specimens, which reach from less than 6 mm up to 7.1 mm, seem clearly to be immature; their gonopods seem to be not fully developed. This is particularly obvious on females of less than 7 mm, which have only 1+1 spurs on the basal article, or 2+2 with the internal clearly smaller; but it is much less obvious on both individuals of 7 and 7.1 mm. The antennae of immatures have up to 25-26 articles. Enghoff *et al.* (2013) have said that the body-size of females with fully developed gonopods is from 7 to 10 mm, but they have examined more specimens from various localities; thus their range is more complete than ours.

Antennae: on the ten pairs of antennae, i.e. twenty antennae in detail, we have counted eleven times 28 articles, four times 29 articles (Fig. 1), twice 27 articles, once 26 articles and once 25. One other antenna was incomplete.

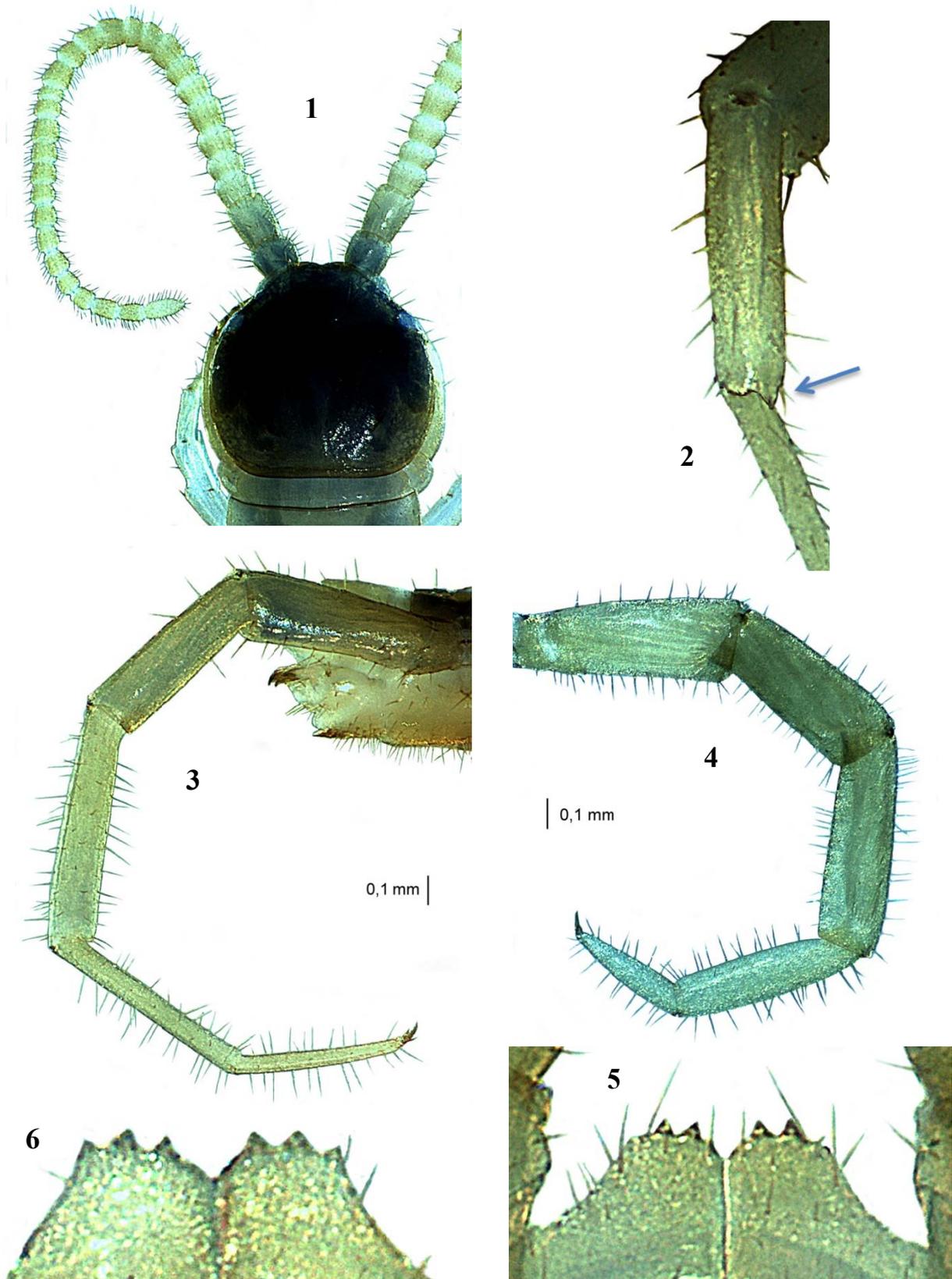
Ocelli: all females have one very large pale ocellus on each side of the head (Fig. 1).

Forcipular teeth: all females have 2 + 2 teeth on the distal edge of the coxosternum (Fig. 5). There is a small lateral shoulder on each side of the lateral teeth, but no third teeth unlike in *L. emarginatus* (Fig. 6).

Legs of the 12th leg-bearing segment: the triangular distal spinose projection is visible on the 12th tibiae of all adult females (Fig. 2 - arrowed), but it is more developed in some cases than in others.

Legs of the 15th leg-bearing segment: length of each of the three distal articles of the 15th legs in comparison with their own diameter. 15th tibiae: 0.78-0.82 mm/0.16 mm = 4.9x-5.1x; 15th tarsus 1: 0.72-0.75 mm/0.09 mm = 8x-8.3x; 15th tarsus 2: 0.53-0.56 mm/0.06 mm = 8.8x-9.3x. A 15th leg of a *L. africanus* from Arles is illustrated (Fig. 3) with also a 15th leg from a French *L. emarginatus* (Fig. 4).

Accessory apical claws of 15th legs: the accessory claws reach approximately almost the middle of the main claw.



FIGURES 1-6: *Lamyctes africanus* and *L. emarginatus*

1) Head and left antenna of *L. africanus*; 2) 12th leg of *L. africanus*; 3) 15th right leg of *L. africanus*; 4) 15th left leg of *L. emarginatus*; 5) Forcipular teeth of *L. africanus*; 6) Forcipular teeth of *L. emarginatus*. Pictures taken by E. Iorio of *L. africanus* from Arles and of *L. emarginatus* from Le Louroux (Indre-et-Loire department, France)

PRESENT KNOWN DISTRIBUTION

According to Enghoff *et al.* (2013), *Lamyctes africanus* was known in the past to be present in the following area outside Europe: South Africa, South-West Australia, Île Saint-Paul, Hawaii. Other records are quoted from outside Europe in the literature and some of these records are quite possibly correct according to Enghoff *et al.* (2013), but these authors consider that these records must be regarded as uncertain without revision.

In Europe, *L. africanus* has in the past been found in the following countries: Great Britain, in Edinburgh (greenhouses) (Barber, 1992), Denmark, various localities, always from more or less disused railway areas (Enghoff *et al.*, 2013), Olomouc in Czech Republic (Dányi & Tuf 2016), several localities in Germany (near rivers but also in other habitats as per example a meadow in a military field) (Decker *et al.*, in press) and Arles in France (garden, in flowerpots) (present study). In all these localities, *L. africanus* is considered as clearly introduced, probably brought with plants by trains or by vehicles.

In Arles, it is very probably well established at least in the studied garden because of the fairly numerous specimens of various stadia which we have found. It is thus the 150th addition to the French centipede checklist (146 species and 4 subspecies), after *Lithobius (Lithobius) brusteli* Iorio, 2015 and *L. (L.) derouetae* Demange, 1958 (Iorio, 2014, 2015, 2016).

POSSIBLE OCCURRENCES IN FRANCE AND ELSEWHERE IN EUROPE

Enghoff *et al.* (2013) have also quoted a French case of a specimen identified as *Lamyctes emarginatus* which belongs probably to *L. africanus*. The specimen came from Annemasse (Haute-Savoie department) and has been found by Guillaume Jacquemin (<http://www.galerie-insecte.org/galerie/ref-66072.htm>) but this data has not been confirmed because it is only based on some pictures. We have asked Guillaume if he has kept the specimen, but unfortunately he did not. In fact, several other records quoted as *L. emarginatus* in the past by various European authors belong potentially to *L. africanus*, as errors underlined by Enghoff *et al.* (2013) and Decker *et al.* (in press) for themselves (Decker *et al.*, 2009; Enghoff *et al.*, 2011), as well as us for the case of our previous identification revised in this study. Thus, we think that it would be useful to revise various materials previously identified as *L. emarginatus* from Europe, particularly those coming from habitats similar to those quoted above, as well as to search for *L. africanus* in various European countries to find possible new locations.

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