Description of a new individual form of *Carabus* (*Chrysocarabus*) *auronitens* ssp. *auronitens* (Coleoptera: Carabidae)

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Abstract. The author describes a new individual form of *Carabus* (*Chrysocarabus*) *auronitens* ssp. *auronitens* and gives some particularities about the polychromatic character of the species as well as the habitat.

Samenvatting. De auteur beschrijft een nieuwe individuele vorm van *Carabus* (*Chrysocarabus*) *auronitens* ssp. *auronitens* en geeft informatie over het polychromatisme bij deze soort en over het habitat.

Résumé. L'auteur décrit une nouvelle forme individuelle de *Carabus* (*Chrysocarabus*) *auronitens* ssp. *auronitens*, et donne quelques particularités concernant le polychromatisme de l'espèce ainsi que des informations sur le biotope.

Keywords: *Carabus* – *auronitens* – individual form – Belgium.

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In Belgium, *C.* (*Chrysocarabus*) *auronitens* Fabricius, 1972 is distributed in the forested areas in the S. and E., usually to areas 200 m. above sea level (Turin *et al*. 2003). On the Flemish Red List *C.* (*Chrysocarabus*) *auronitens* is marked as 'rare', and since 1980 it is protected by law (Desender *et al*. 2008). In the Walloon region it is not protected. The species is a rather remarkable one due to the polychromatic range of individuals, whether partially or complete. Within the area of distribution almost all subspecies of *C. auronitens* present an enormous range of chromatic tendencies. These aberrations are the result of genetic combinations, caused by inbreeding, as well as geographical and meteorological conditions. Even to this moment new individual forms get discovered and described, thus contributing to the knowledge, taxonomy as well as mutual understanding between carabologists and entomologists worldwide.

Fig. 1. Felling of trees in the region of Neupré, Belgium in June 2016, © I. Peeters.

In Belgium there are two populations which show a high tendency towards hyperchromatism[1], melanisation[2] and hypochromatism[3]: The Fôret de Soignes (Dutch: Zoniënwoud) near Brussels and the eastern region of Neupré, near Liège. In certain areas of the Fôret de Soignes, the holomelanistic form *putzeysi* Mors, 1843 can locally sometimes be very abundant (up to 20%), but on average numbers reach about 7%. One early hypothesis stated that the melanisation with putzeysi is the result of an interruption in the chromatic process (Radisic 1979). However, backcrossing experiments have clearly shown that melanisation is the result of a genetic deviation, since *putzeysi* × *putzeysi* = 100% *putzeysi*. Crossbreeding *auronitens* × *putzeysi* resulted in 100% *auronitens* in the first generation. Crossing those same individuals yielded 25% of *putzeysi*. This is conclusive evidence of the recessive character (Maguerre *et al.* 2012). Hyperchromatic forms such as *ignifer* Haury, 1889 and *aureopurpureus* Lapouge, 1898 are much rarer in this forest, and in some years almost to even completely absent (Maguerre *et al*. 2012). In 2010 I discovered there one hypochromatic specimen (f. *coerulescens* Letzner, 1850) and according to Damien Maguerre these hypochromatic forms are exceptionally rare in that locality (personal communication, December 2017).

Fig. 2. *C.* (*Chrysocarabus*) *auronitens* f. *spinolatus* © I. Peeters.

In the region of Neupré, *C. auronitens* is dispersed in a limited amount of smaller, isolated forests. Some of these

[1] hyperchromatism: excessive pigmentation, ranging from slighty coppery red to an almost dark purple.

[2] melanisation: the production, accumulation, or deposition of melanin resulting in a black(ish) colour. Two different variations, e.g. holomelanisation (head, pronotum and elytra are very darkened) and hemimelanisation (head and pronotum keep the colour of the species typica, elytra very darkened).

[3] hypochromatism: lack of red colour pigmentation, resulting in forms that vary between a bright, metallic green and blue.

woodlands are not larger than a couple of hectares. They are cut off from each other by habitation, roads, fields or farmlands. Almost all of these smaller forests are private property, and most of them are being exploited for hunting purposes and firewood. Over the course of a few years I have witnessed acres of trees being felled, thus decreasing the habitat year by year (fig. 1). Some of these woods are very atypical, yet suitable, habitats for *C. auronitens*, a species which normally prefers shady forests with a domination of beech (*Fagus sylvatica*).

Some locations in the Neupré region have a total lack of beech trees, instead housing fields of stinging nettles (*Urtica*) under poplars (*Populus*), spruces (*Picea*) and hawthorn (*Crataegus*) (Henderickx 1998). *C. auronitens* strongly depends on a moist habitat, and the felling of the trees will result, as a direct consequence, in a dryer habitat. This fragmentation seems to be both the destroyer and the midwife of the high polychromatic variety in the present populations of *C. auronitens* for which the region is known; the restricted habitats cause inbreeding and introgression. *C. auronitens* shows an extreme genetic variability over the isolated (relict?) populations (Turin *et al.* 2003). As stated before, in the long run these small woods will disappear, and with them, the ground beetles and other wildlife. Even though some literature does mention *C. auronitens* as a species with a good power of dispersal (Turin *et al.* 2003), I have found this species to be missing from an (in theory) very suitable habitat in a contiguous, large forest.

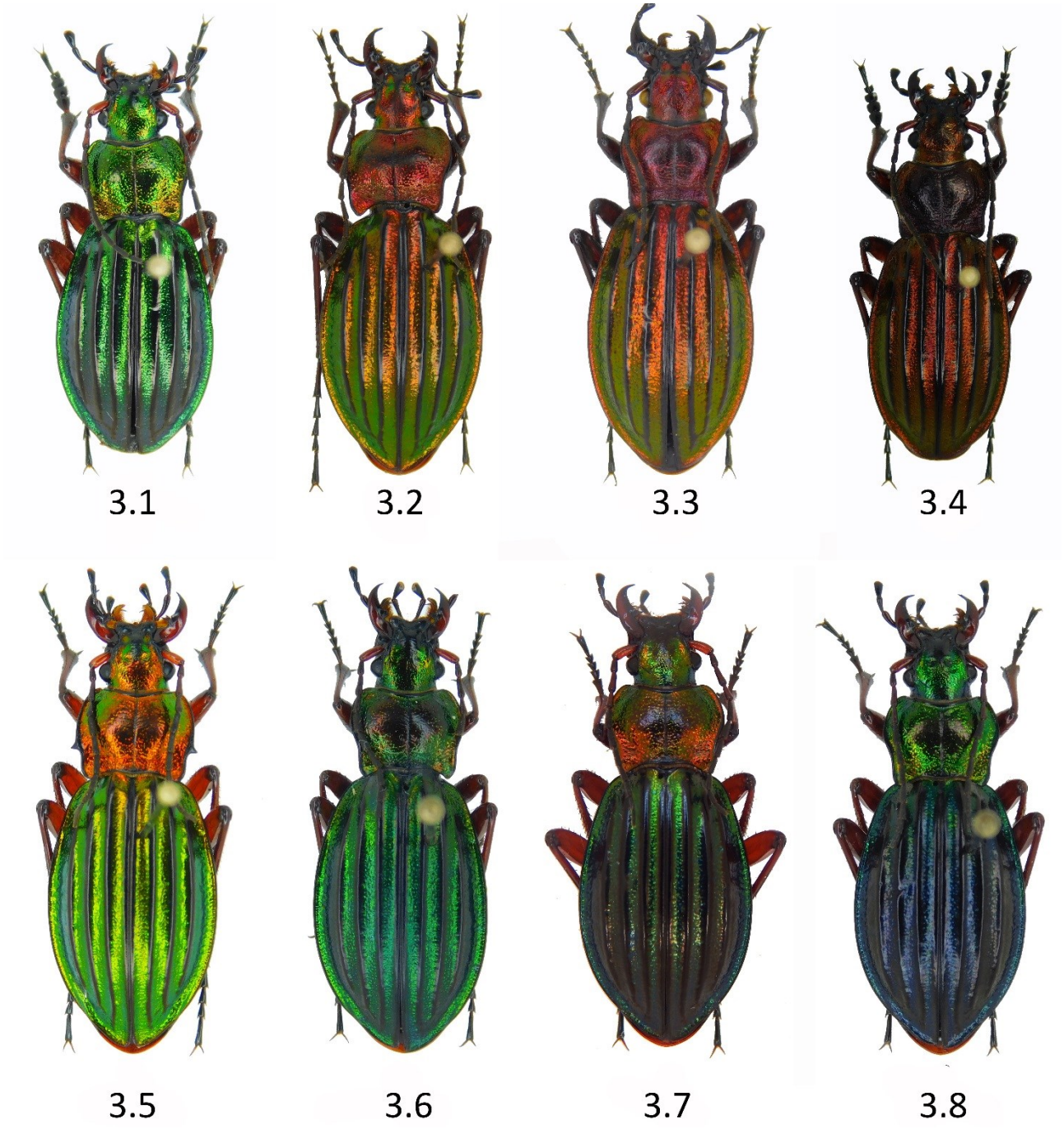

Fig. 3. Some individual forms of *C.* (*Chrysocarabus*) *auronitens* from the Neupré region - Fig. 3.1 f. *perviridis* Reitter, 1896, fig. 3.2 f. *ignifer* Haury, 1889, fig. 3.3 f. *aureopurpureus* Lapouge, 1898, fig. 3.4 f. *novi-prati* Maquet, 1991, fig. 3.5 f. *spinolatus* Maquet, 1999, figs 3.6 & 3.7 f. *atronitens* Henderickx, 1998, fig. 3.8 f. *coerulescens* Letzner, 1850. © I. Peeters.

In Neupré the occurring individual forms include, amongst others, f. *perviridis* Reitter, 1896 (fig. 3.1), f. *ignifer* Haury, 1889 (fig. 3.2), f. *aureopurpureus* Lapouge, 1898 (fig. 3.3), f. *novi-prati* Maquet, 1991 (fig. 3.4), f. *atronitens* Henderickx, 1998 (figs 3.6 & 3.7), and f. *coerulescens* Letzner, 1850 (fig. 3.8). The best known example is the very rare individual form *spinolatus* Maquet, 1999 (figs 2 & 3.5), with the very distinct bilateral (sometimes unilateral) protuberances on the thorax. Furthermore, crossbreeding experiments proved that the dark purple-garnet colour of *novi-prati* also has a genetic recessive character (Maquet 1991).

During the month of June of 2016, I discovered a specimen of *C. auronitens* of which I considered, at first sight, as a 'normal' hyperchromatic variation. During a second glance, in full daylight, it was noticeable that the insect lacked the reddish shine of f. *ignifer* and f. *aureopurpureus*, and wasn't near as dark purple-garnet as f. *novi-prati*. The elytra displayed an overall olive light brown, golden metallic shine, and a greenish brown rim at the sides. The thorax displayed a luminous coppery golden shine, also darker than the typical species. All other features are similar to the typical *C. auronitens* morphology. The only individual form that comes the closest in colour to the one I found in Neupré is f. *pallens* Lapouge, 1924, an individual form of *C.* (*Chrysocarabus*) *splendens* Olivier, 1790. F. *pallens* was described by Lapouge as 'laiton pale': pale golden (Maguerre 2004). To my best of knowledge, no such colour aberration has been described for *C. auronitens* yet, so I will name this form *rensoni*, after my good friend, colleague and mentor Bruno Renson. Together with Bruno, whom I have known for 20 years, I have spent many great moments in forests, woodlands, meadows and marshes, in the search and study of ground beetles.

Carabus (***Chrysocarabus***) ***auronitens auronitens*** f. ***rensoni*** **nova** (fig.4)

Holotype ♂: 22 mm, Belgium, Neupré region, vi.2016, leg. & coll. Peeters.

Fig. 4. *Carabus* (*Chrysocarabus*) *auronitens auronitens* f. *rensoni* **nova**. © I. Peeters.

Holotype ♂: 22 mm, Belgium, Neupré region (Liège), vi.2016, leg. & coll. Peeters. During the month of June 2016, I discovered an *auronitens* of which I thought of, at first sight, as a 'normal' hyperchromatic variation. During a second glance, in full daylight, it was noticeable that it lacked the red shine of f. *ignifer* and f. *aureopurpureus*, and wasn't near as dark maroon as f. *novi-prati*. The elytra display an overall olive light brown, golden metallic shine, and a greenish brown rim at the sides. The thorax displays a luminous coppery golden shine. All other features are similar to the typical auronitens morphology. The only individual form that comes the closest in colour to the one I found in Neupré is f. *pallens* (*Carabus* (*Chrysocarabus*) *splendens* Lapouge, 1924). F. *pallens* was described by Lapouge as 'laiton pale': pale golden. To my best of knowledge, no such colour aberration has been described yet, so I will name this form *rensoni*, after my good friend, colleague and mentor Bruno Renson, with whom I have spent many moments in forests, woodlands, meadows and marshes, searching for ground beetles.

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