

On the taxonomy and biogeography of **Microcreagris** related genera in Eurasia (Neobisiidae, Pseudoscorpions)

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Résumé

Une étude du genre *Microcreagris* Balzan et ses espèces affines, a été entreprise afin d'élargir nos connaissances taxonomiques de ce genre et d'offrir une meilleure compréhension de la position systématique que prennent les espèces de pseudoscorpions de ce complexe "*Microcreagris*".

A comparative morphological analysis of some representatives of *Microcreagris* BALZAN, along with sixteen related genera of the pseudoscorpion family Neobisiidae, has revealed a complex of characters common to most species within each of the genera studied. Apart from the genital structures, almost all characters appear to be common to species in a genus from the protonymph to adult stages. Gaps between genera are therefore based on a different distribution of the same complex of characters (CURCIC 1978, 1981, 1983, 1984, 1985).

Sixteen genera, closely related to *Microcreagris* (MAHNERT 1979) have recently been recognised: *Levigatocreagris* CURCIC, *Chinacreagris* CURCIC, *Orienteagris* CURCIC, *Pedalocreagris* CURCIC, *Bisetocreagris* CURCIC, *Acanthocreagris* MAHNERT, *Balkanoronus* CURCIC, *Roncocreagris* MAHNERT, *Lissocreagris* CURCIC, *Tuberoagris* CURCIC, *Americocreagris* CURCIC, *Cryptocreagris* CURCIC, *Fissilicreagris* CURCIC, *Australinocreagris* CURCIC, *Staetigerocreagris* CURCIC and *Tartarocreagris* CURCIC, ranging from western North America via the Eurasian land mass to the Maritime Province (Soviet Far East) and Philippines (Fig. 1) (CURCIC 1978, 1982, 1983, 1984, 1985).

The common characters of species that serve as indicators for these genera are: the form of galea, structure of the flagellum, form and position of genital sacs, chaetotaxy of genital opercula, chaetotaxy of abdominal sternites (uniseriate or biseriata), number of chaetae on the manducatory process, chaetotaxy of pedipalpal trochanter (presence or absence of interior chaetae), presence or absence of granulations on pedipalpal articles, relative position of trichobotria, number and relative position of pedal tactile setae, and presence or absence of such setae on telotarsi IV. The systematisation was effected by analysing correlative characters in species groups of the same taxonomic rank. Some

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characters, constant in one species group of generic rank and absent in others probably point to the possibility of a parallel evolution, and not of direct monophyletic origin. Such, for example, are the absence of sensitive setae on telotarsi IV, and presence or absence of accessory setae on sternites V-X (CURCIC 1983, 1984, 1985).

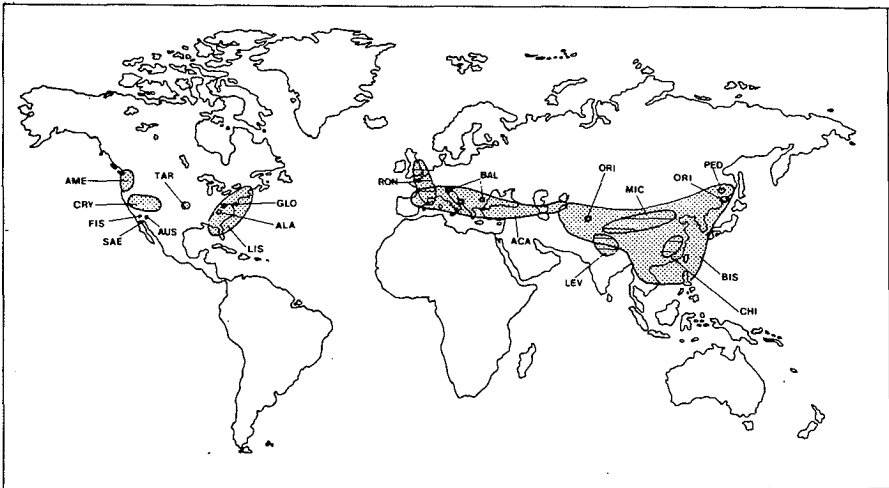


Fig. 1.- Distribution areas of *Microcreagris* Balzan (MIC) and its related genera (after Curcic, in press).

On the basis of the distribution of these characters, an analysis of the inter-relationships of genera has been made. *Microcreagris* and *Levigatocreagris* are the most primitive in the group of the Asian genera (CURCIC, in press); the most widely differentiated genus, *Bisetocreagris*, from central and south-eastern Asia, is probably phylogenetically younger than the above-mentioned genera. Other Asian genera belonging to the "Microcreagris"-complex are more or less closely related to *Bisetocreagris* and probably originated synchronically or later than this genus, in a process of divergent differentiation of the primordial populations on the rim of their distribution areas (CURCIC in press).

Of the European genera, the most primitive is *Acanthocreagris* (CURCIC, 1978), from which the cave-dwelling *Balkanoroncus* probably evolved (CURCIC 1975). The relationship between these two genera and *Roncocreagris* is still insufficiently clear, although it is evident that this genus is phylogenetically distant both from *Acanthocreagris* and *Balkanoroncus* and might possibly represent a transitional form (link) towards *Roncus*- and *Neobisium*-related genera.

In the group of North American *Microcreagris*-related genera the most primitive features are found in *Saetigerocreagris*, *Fissilicreagris* and *Australinocreagris*, while consistent changes have been noted in the direction of *Cryptocreagris* on the one hand, and *Lissocreagris* and *Tuberoocreagris*, on the other. The positions of *Americocreagris* and *Tartarocreagris* are still not sufficiently clear, due to the lack of pertinent data (CURCIC, 1984).

The affinity and probable common origin of these groups of genera is supported by biogeographical and phylogenetic studies of their species which lead to the assumption that primordial populations colonised the ancient Eurasian-North American land mass at the beginning of its existence, i.e. well before the beginning of the Tertiary. The numerous discontinuities in the distribution of the endemics and relictary forms suggest that pre-Tertiary pseudoscorpion fauna on this vast land mass was locally exposed to varying degrees of destruction, either as a result of climatic changes or geotectonic events, or competition from immigrants (KURTEN 1969, VALERI-DICASTRI 1973, CURCIC 1975).

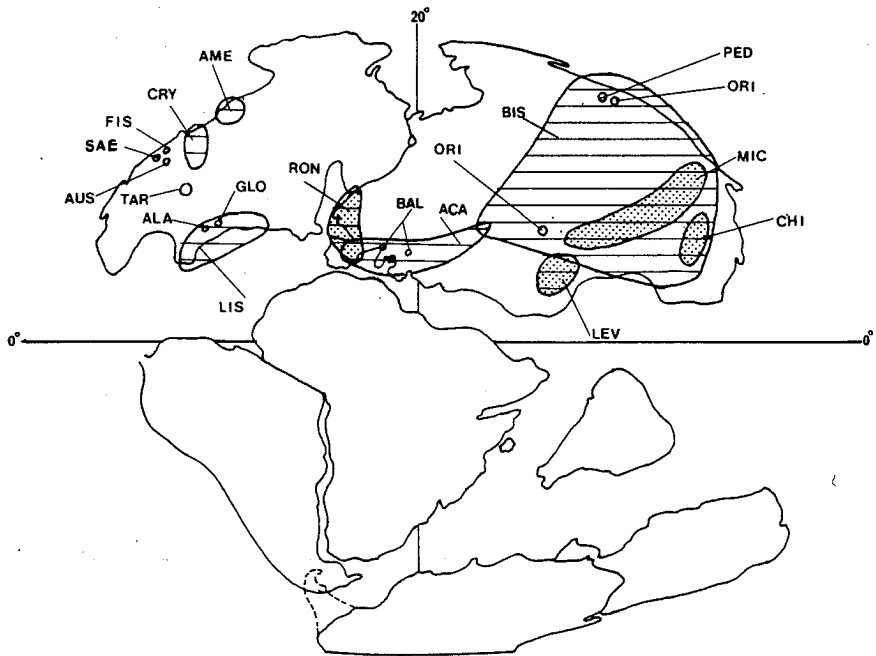


Fig. 2 - Projection of the ranges of *Microcreagris*-related genera onto the outline of the Laurasian land mass before the end of the Jurassic (after Curcic, in press).

The projection of the recent distribution areas of *Microcreagris*-related genera onto the former outline of the Laurasian land mass (CLOUD 1970, DIETZ & HOLDEN 1970) after the end of the Jurassic shows, on the one hand, that their origin is connected with the period following the separation of Laurasia, which is documented by the absence of analysed genera in the southern continents (Fig. 2). Consequently, this ancient land mass can be considered to be the centre of origin of *Microcreagris*-related genera as well as the centre of their subsequent radiation in various directions.

In view of the exceptional diversity of the present "*Microcreagris*"-complex in Asia, it is probable that the primordial population differentiated very early in the central and

eastern parts of the Laurasian land mass. Later, as a result of the breakup of Laurasia and as well as of divergent differentiation, the North American and Eurasian genera and species originated.

The most intensive radiation of these archaic genera (at least of some of them) into species, in all probability, took place during the Alpine Orogeny, and also later under conditions underlying the process of karstification which affected vast regions of the northern hemisphere. It is worth mentioning that the development of new, lower taxa was effected mainly on the periphery of the distribution area of the primordial forms (CURCIC 1975).

Without dwelling further on the origin of the groups of *Microcreagris*-related genera that inhabit Eurasia and North America, it should be pointed out that these forms represent the last vestiges of an ancient faunal complex which found shelter in subterranean, but also in other refugial milieux on these two vast land masses.

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