Can Macrothele calpeiana (Walckenaer) (Araneae, Hexathelidae) be used as a bio - indicator?

Autor(en): **Helsdingen, Peter J. van**

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Can *Macrothele calpeiana* (Walckenaer) (Araneae, Hexathelidae) be used as a bio - indicator ?

par
Peter J. van Helsdingen

In 1987 *Macrothele calpeiana* became a Bern Convention species. The full name of the Bern Convention is the Convention on the Conservation of European Wildlife and Natural Habitats. The Convention itself has a juridical structure and there are no names of species in it. The species are listed separately in Appendices. *Macrothele calpeiana* figures in Appendix II, the "Strictly protected fauna species". The vital core of the Convention, particularly in relation to invertebrates, is article 4, which deals with the protection of habitats.

The Bern Convention functions on the European level. It is a product of the Council of Europe and the member states, after ratifying, have to care for implementing it in their respective countries. The species in the appendices are selected, among others on their status of being vulnerable or endangered. The final decision on the composition of the appendices has all the characteristics of political play. Proposals are put forward by the permanent secretariat, taken home by the delegations and discussed at the relevant ministerial levels in each member state and subsequently are accepted or turned down at the next meeting.

As usual the Bern Convention started with birds and mammals, of which animal groups the knowledge is more generally available. Many countries already had bird or game acts and the decline and sometimes near - extinction of many of these larger vertebrates was even known to the general public. In 1987 for the first time invertebrates were included. A list of 78 species was proposed for inclusion in the appendices by the IUCN Conservation Monitoring Centre at Cambridge (UK) and, with a few modifications, was adopted. Butterflies and molluscs dominate, and there are beetles and dragonflies, and

one spider, *Macrothele calpeiana*. It is not surprising that butterflies score high among the invertebrates added: among the insects butterflies are popular with entomologists and attractive to everybody. Their decline has been noticed and is seen as a sign of the deterioration of nature. In 1989 the European Invertebrate Survey (E.I.S., E.E.W., C.I.E.) became involved with the invertebrate part of the Bern Convention. The Bern Convention Committee agreed that the inclusion of an invertebrate species in the appendices should be based on sound knowledge of its distribution and ecology, just as with the vertebrates. The E.I.S. because of its international network of invertebrate taxonomists and ecologists and their data - bases ("data - banks") was decided to be the appropriate body to bring together as much information as possible over the complete geographical range of a species and provide the required sound basis for its inclusion in the Bern Convention appendices. It also has become the task of the E.I.S. - members in the so - called Group of Experts at Strasbourg to propose new candidates for the appendices and request removal of old ones when their inclusion proves to be wrong. There is, of course, only one way to handle the matter properly: start with collecting available data from the literature, from taxonomists and ecologists, for any possible candidate suggested by anybody. With the aid of the thus accumulated information one then can decide whether the species should be included in the appendix of the Bern Convention or not. It is of no use, indeed it has strongly negative effects, if a species is placed on the appendix on incomplete and insufficient information and is found out afterwards that its position there is disturbing and untenable. Such actions undermine the credibility of nature conservation. The arguments for selecting a species are found by testing against a set of criteria and the terms of reference for the Group of Experts even allow of adapting the set of criteria to one suitable for dealing with invertebrates. The life conditions are often much more complex for invertebrates than for vertebrates and the term habitat is often less easily defined for e.g. insects that depend on aquatic habitats in their early stages but use drier habitats for their further development.

As indicated above, the Bern Convention concentrates on animals that are endangered or vulnerable. These are not biological criteria, but the deplorable result of human interference with nature. The obligation to protect the habitats of the included species lifts the convention above the level of mere species protection. If we could put bio - indicators on the list, which are characteristic for a certain type of habitat, the protection of the habitat would be the goal and the species the medium to reach that goal. SPEIGHT (1986) already listed a number of criteria for the selection of species to be used as bioindicators.

In fact this has been more or less the reason for including the spider *Macrothele calpeiana* in the appendices of the Bern Convention. SNAZELL (1986) published a three - page note on this large spider known to occur in the southern tip of Spain, where it had been recorded from a few localities only. SNAZELL now found the species on many sites in a more extensive area and put forward a hypothesis that the occurrence of the spider

was correlated with the area of high rainfall in the South. Moreover, SNAZELL stated the species to have as its optimum habitat undisturbed Cork oak woodland (*Quercus suber* L.) which according to him is under threat of exploitation of the woods and the spread of housing developments, although he sees no immediate danger. Still the Conservation Monitoring Centre picked up the message and included *Macrothele calpeiana* in their list of endangered invertebrate species (COLLINS & WELLS 1987). It is treated as a bio - indicator for Cork oak woodland and the creation is suggested of special protected sites where this species is common.

As indicated above, entering a species in a Bern Convention appendix should be based on sound knowledge about its distribution in present and past and its ecological requirements. SNAZELL (1986) publication contains a distribution map which indeed shows many more sites than the few published with the original description and in subsequent decades. He does not specify his localities and only summarizes his ecological data. About at the same time, but unobserved by COLLINS & WELLS (1987), another publication on *Macrothele* appeared (BLASCO & FERRANDEZ 1986). This distribution map already shows a more extensive range if compared with that of SNAZELL (1986), with unexpected records from Huelva, much to the North, and North Africa (Spanish Morocco), the latter supporting an earlier record from North Africa (Algeria) by LUCAS (1846). All localities are listed with UTM-coordinates for 10 x 10 km squares. Nothing is said about the habitats of the different sites. Finally SNAZELL & ALLISON (1989) recapitulate their own 1986 results and those of BLASCO & FERRANDEZ (1986), bringing together all the localities on one map and specifying some of their own with UTM-coordinates at a 1 x 1 km square accuracy. They elaborate on the ecology (vegetation and rainfall) and discuss their ecological and biological findings. Recently further progress has been made through our own research (VAN HELSDINGEN & DECAE in press) and the following overall picture is derived from both literature sources and our own data.

The interpretation of the distributional data from the recent articles proved to be difficult. While BLASCO & FERRANDEZ (1986) presented grid - references for all localities at 10 km accuracy these are sometimes difficult to correlate with the small and rather schematized map. SNAZELL & ALLISON are much more accurate with their one km accuracy, but their map is at a completely different scale and without any grid, leaving one but to guess about the exact positions of the unlisted localities. Also some of BLASCO & FERRANDEZ' localities were not included. If an author publishes fresh data in such a way that they cannot be reproduced easily by subsequent users their scientific value is severely diminished.

In order to obtain a practical distribution map we decided to transform all distributional data to a 5 x 5 km UTM-grid, our own (1 km accuracy) as well as those from the

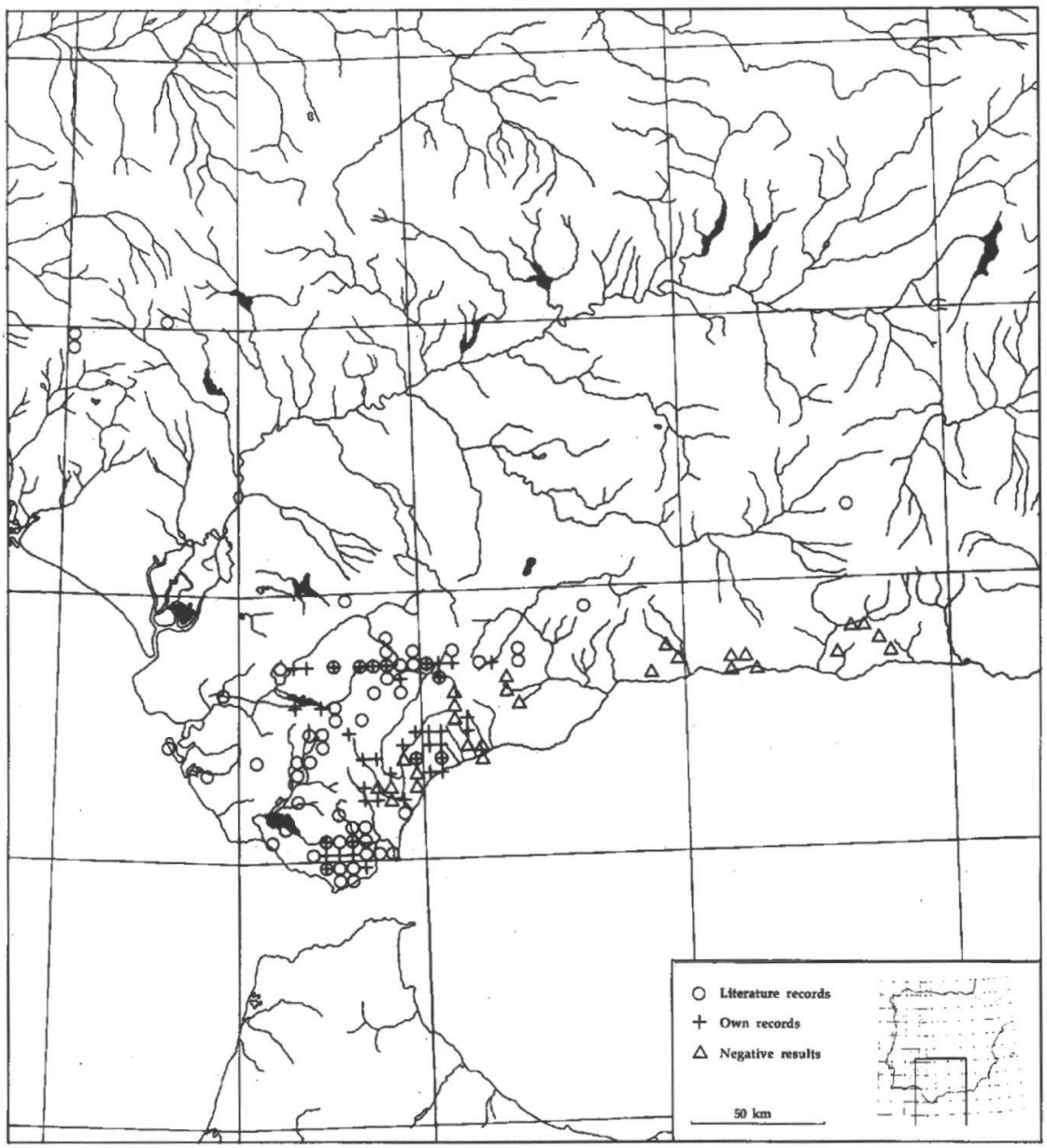

Fig. 1. - Provisional distribution - map of *Macrothele calpeiana* in Spain and North Africa (Algeria not included) using 5 x 5 km UTM - grid.

literature (fig. 1). This allows new records to be put in very easily. We have also marked the localities where *M. calpeiana* was not found, though this negative result, of course, refers to the sites visited only and not to the whole 5 x 5 km area, just as a positive symbol refers to a site or sites within the 5 x 5 km square and does not mean a complete coverage of the whole square. A 5 km accuracy suffices to indicate the distribution of a species in an area of at least 300 x 250 km.

We have added quite a number of localities in the very south in the Tarifa - Algeciras region and in the region around Estepona, as well as in the Ronda - Grazalema - Arcos de la Frontera belt. Many others were confirmed. Most sites lie within the zone of an

annual precipitation of 80 - 100 cm, as do most of the records from the literature. The coastal area from Malaga to slightly east of Motril appeared to be devoid of *Macrothele*. Thus the core of the distribution area remains as indicated by the earlier authors: between the city of Cadiz and Malaga and south of the line Jerez - Antequera. The outer boundaries of the whole distribution area of the species, however, are far from established. If one realizes that within the last decade the species has been found north of the Guadalquivir in the province of Huelva (on three localities), in the Sierra Harana, north of Granada (one locality, leg. BARBARA Y. MAIN) and in Spanish Morocco (one locality, BLASCO & FERRANDEZ 1986) one may expect quite a number of new discoveries and an extension of the known range. It is, therefore, much too early to talk about a vulnerable or endangered species. We need further inventories first leading to a more or less "complete" distribution map. The new records do indeed come from areas with high precipitation and SNAZELL hypothesis should be tested further, also for other regions with comparable rainfall but without any records yet.

During our fieldtrips we have come to conclusions that differ to a large extent from those of SNAZELL & ALLISON (1989). *Macrothele calpeiana* is common on suitable sites, where shade is offered and hiding conditions are available, such as cracks or holes in the soil, boulders or logs of wood. Bare, open soil with full exposure to sun, and maybe wind and rain, are shunned. Cork oak forest or mixed forest, if the spider occurs there, harbours low density populations. Olive and Eucalyptus cultures score higher as do road - sides, rubbish dumps, picnic places and city walls. Cultivated oakland scores higher than undisturbed forest. So far the Guadalquivir valley with its lowland farmland appears empty space as far as *Macrothele calpeiana* is concerned. It is largely unforested and has a low precipitation, but there may be other limiting factors involved. One gets the impression that the species, in suitable habitats, benefits from mild human interference and when conditions become extreme is able to hold its own, e.g. by becoming arboreal. We may call it an aggressive species, in the ecological sense, which favours dynamic situations. We also may pose the question whether the recent extension of the known geographic range is the result of more intensive fieldwork or due to active spreading of the species in recent times.

M. calpeiana is certainly not endangered. Neither is it a bio¬indicator for Cork oak woodland. A bio - indicator for a certain habitat has a strong and often obligatory relationship with that particular habitat. The species becomes less abundant when the habitat deteriorates and gradually disappears when the habitat degenerates, or at least loses its particular character. It therefore can be used as a numerical parameter for the quality of the habitat. We have found that *M. calpeiana* has no obligatory relationship with Cork oak woodland as a natural habitat.
We conclude that *M. calpeiana* has been placed too quickly and without sufficient knowledge of its basic ecology in an appendix of the Bern Convention, where it serves no practical purpose.

REFERENCES

BLASCO, A. & FERRANDEZ, M.A. - (1986). El genero *Macrothele* Ausserer 1871 (Araneae, Dipluridae) en peninsula Iberica. *Actas X Congreso Internacional de Aracnologia, Jaca/España.* 1: 311 - 320.

COLLINS, N.M. & WELLS, S.M. - (1987). Invertebrates in need of special protection in Europe. *Council of Europe, Nature and Environment Series.* 35: 1 - 100.

HELSDINGEN, P.J. VAN & DECAE, A.E. - (in press). Ecology and distribution of *Macrothele calpeiana* (Araneae, Hexathelidae), a basis for further investigation. *Tijdschrift voor Entomologie.*

LUCAS, H. - (1846). Histoire naturelle des animaux articulés. *Exploration scientifique de l'Algérie pendant les années 1840, 1841 et 1842.* 1: 89 - 271. *Paris.*

SNAZELL, R.G. - (1986). The spider genus *Macrothele* Ausserer in Spain (Araneae; Dipluridae). *Bulletin of the British Ecological Society.* 17 (1): 80 - 83.

SNAZELL, R.G. & ALLISON, R. - (1989). The genus *Macrothele* Ausserer (Aranaea, Hexathelidae) in Europe. *Bulletin of the British Arachnological Society.* 8: 65 - 72.

SPEIGHT, M.C.D. - (1986). Criteria for the selection of insects to be used as bio - indi cators in nature conservation research. *Proceedings of the 3rd European Congress of Entomology.* 3: 485 - 488.

Peter J. VAN HELSDINGEN
Rijksmuseum van Natuurlijke Historie
Raamsteeg 2, NL-2311 PL LEIDEN