

## **Chrysopidae of the Palearctic Region – a review**

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### **Summary**

In the Palearctic Region we know at present 150 valid species of Chrysopidae. All three subfamilies are represented.

The distribution of the **Apochrysinæ** is restricted essentially to the southern hemisphere. Only the genus *Nacaura* (1 sp.) is so far known from Japan.

The **Nothochrysinæ** are represented with two genera: the holarctic *Nothochrysa* (2 sp. in Europe, 1 sp. in California) and *Hypochrysa* (1 sp. in Europe and Anatolia).

The major part of species belongs to the subfamily **Chrysopinæ**. Indigenous genera are *Chrysotropia* (2 sp.), *Cunctochrysa* (2 sp.), *Rexa* (2 sp.), *Tjederina* (1 sp.), *Atlantochrysa* (3 sp.), *Tumeochrysa* (5 sp.), *Chrysopidia* (7 sp.) and *Himälochrysa* (1 sp.).

Holarctic genera are *Chrysopa* (33 sp. palearctic, 11 sp. nearctic) and *Nineta* (8 sp. palearctic, 3 sp. nearctic).

Genera with distribution over palearctic and other regions are: *Anisochrysa* (29 sp.), *Chrysoperla* (8 sp.), *Italochrysa* (9 sp.), *Brinckochrysa* (5 sp.), *Suaris* (19 sp.) and *Apertochrysa* (1 sp.).

The family Chrysopidae comprises about 1400 described species which are distributed over the whole inhabited world; about 90 genera have been described until today. The number of valid species can only be assumed with about 1200; how many of the long list of genera will prove to be valid is still rather uncertain.

In this part of the Old World which is called Palearctic Region we know at present 150 valid species which belong to 20 genera. It exists still a list of about 35 species names, most of them described by NAVAS, which could not be examined because the type specimens were not located. So, most probably, they will have to be regarded as nomina dubia. Very probably new species will be detected in future, so the number of palearctic species certainly will increase to 200 or even more.

Usually the family is divided into three subfamilies, all three of them are represented in the Palearctic Region.

The distribution of the subfamily Apochrysinæ is restricted essentially to the southern hemisphere. So harbour Central and South America two genera with seven species, South Africa two genera with three species and the Oriental and Australian Region five genera with 14 species. In the northern hemisphere this group is represented with only one genus and species – *Nacaura matsumuræ* in Japan (map 1).

Also a small subfamily with only a few species are the Nothochrysinæ. This group comprises seven recent genera with 17 species and shows a rather peculiar distribution. We find in our region one indigenous genus which contains only one species – *Hypochrysa elegans*; its distribution includes parts of Central and South Europe and Anatolia. The second genus *Nothochrysa* McLACHLAN shows holarctic distribution. The two known palearctic species (*N. fulviceps*, *N. capitata*) were found only in parts of Europe where they avoid both the northern and the mediterranean parts. From the Western United States the genus *Pimachrysa* ADAMS with five species and one species of the holarctic *Nothochrysa* (*N. californica*) were recorded. The subfamily is further represented in Eastern Australia by two genera with four species and in South Africa with two genera and also four species (map 2).

The major part of all Chrysopidae belongs to the subfamily Chrysopinae. This large group is in urgent need of a worldwide revision. In the following there will be discussed 17 more or less well characterized species groups which for convenience are called genus. It is the belief of the author that not all of them will prove to be real monophyletic groups.

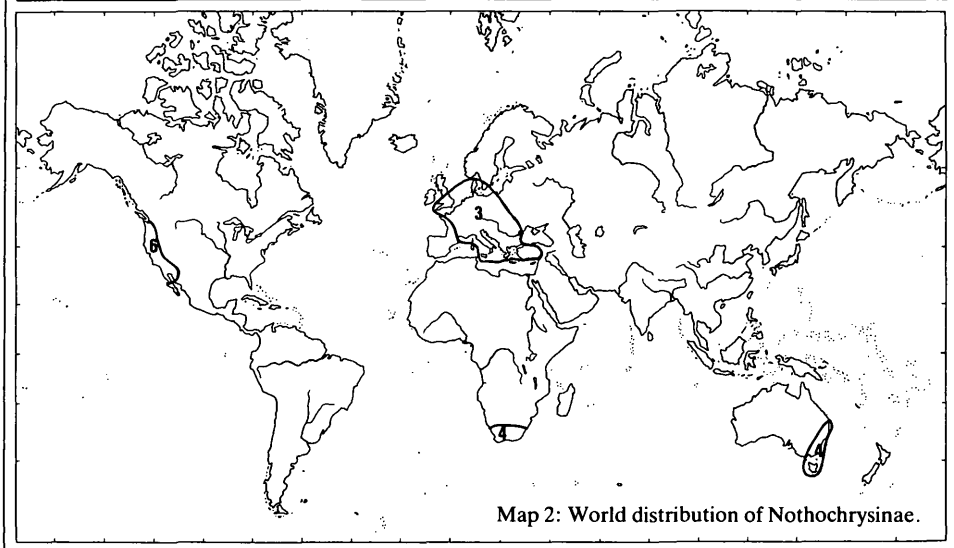
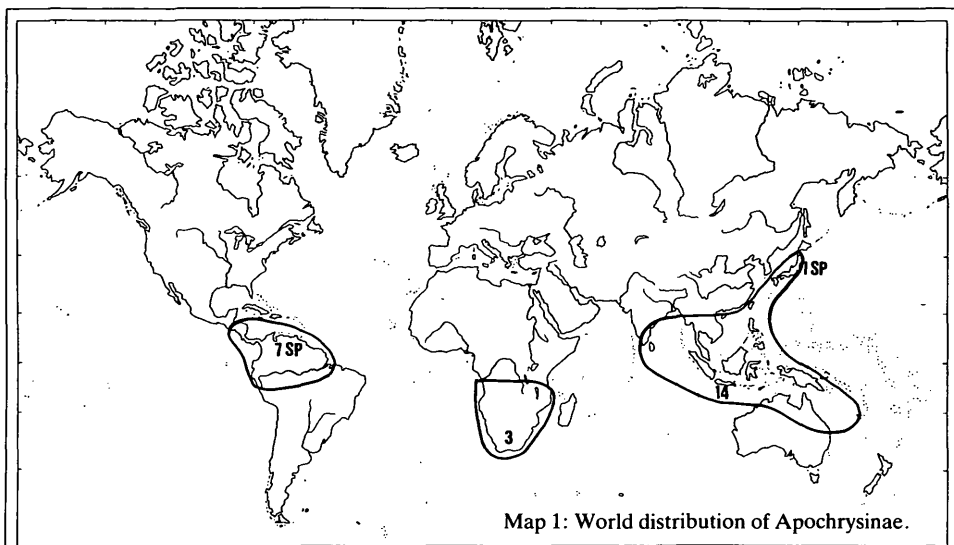
One genus with holarctic distribution is *Chrysopa* LEACH. At present we know in the Palearctic Region 33 species with a rather remarkable pattern of distribution. No less than 24 species represent elements of eastern distributional centers, that means mostly sibirian or mongolian distribution. Only two of them seem to belong to eremian distributional centers – *Chr. sogdianica* found from Mongolia to North Africa and *Chr. dubitans* found from Mongolia to South Spain. The largest number of species was found in Mongolia (16), seven in Japan, seven in Iran, ten in Anatolia, and eleven in Central Europe as well as in the Leningrad district; only six were found in Great Britain and ten in the Iberian Peninsula. Only three species are elements of western distributional centers – *Chr. flaviceps* endemic in the Canaries, *Chr. nierembergi* and *regalis* endemic in the Iberian Peninsula. Six species are elements of other mediterranean distributional centers: *dorsalis*, *walkeri*, *commata* and *hungarica* pontomediterranean, *nigricostata* and *viridana* holomediterranean. Finally we know two species with both sibirian and mediterranean distribution: *formosa* and *septempunctata*, the last being the only *Chrysopa* sp. which has been found in the northern parts of the Oriental Region and, if true, also in Mauritius. There seems to be no actual publication on this genus in America, as far as we know eleven species are known from parts of Canada and the United States (map 3).

One of the most interesting genera is *Nineta* NAVÁS. Its pattern of distribution seems rather uncommon. In the Palearctic Region we know at present eight species; four of them are nearly exclusively inhabitants of extramediterranean parts of Europe, including parts of Anatolia (*N. flava*, *pallida*, *carinthiaca*, *inpunctata*; see map 4 and 5). *N. guadarramensis* represents a holomediterranean faunistical element which has been found also in Northwest-Africa. We find the largest number of *Nineta* species in Central Europe (in Austria six), only two in Great Britain and three in Southern Scandinavia. Two species are possibly sibirian elements: *N. alpicola* at present only known from Japan and *N. vittata* which is distributed both in the east and in the west of the Palearctic Region. There is still one species recently described from Afghanistan, its distribution pattern is at present unknown. As far as we know today the genus is also represented in the United States with three species (map 6).

Nearly related to *Nineta* NAVÁS is the genus *Tumeochrysa* NEEDHAM, known from the Himalaya mountains; five species were hitherto described from Nepal and North India. It can be distinguished from *Nineta* only by characters of the wing venation – the veinlets are not arranged in gradate rows but are dispersed over distal parts of the wings. *Tumeochrysa* NEEDHAM, and in the same way *Chrysopidia* NAVÁS and *Himalochrysa* HÖLZEL represent nepalese faunistical elements which DE LATTIN (1967) has treated as belonging to the Palearctic Region. *Chrysopidia* NAVÁS comprises at present seven species known from Eastern Nepal and the neighbouring parts of China; *Himalochrysa* HÖLZEL was described with only one species from Eastern Nepal (*H. modesta*).

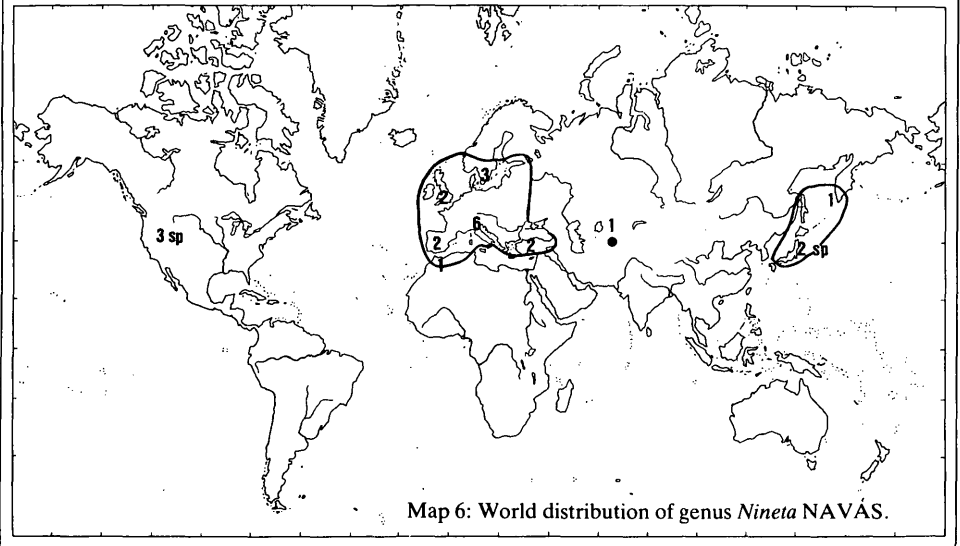
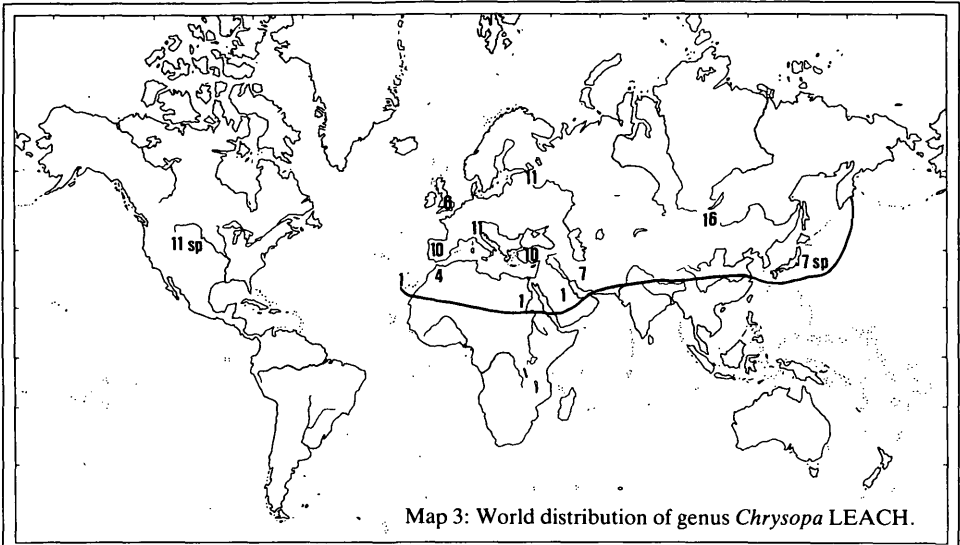
There are still a few indigenous genera to discuss, all rather small, comprising only a few species. There is *Chrysotropia* NAVÁS: two species are known, *Chr. ciliata* a sibirian faunistical element, distributed over Japan and Korea to North- and Central Europe, and *Chr. orientalis* known from East Nepal. The genus *Cunctochrysa* HÖLZEL comprises at present three species: *C. albolineata*, a sibirian faunistical element with rather the same distribution as *ciliata*, and *C. baetica* known only from the mediterranean region; from Nepal *C. jubingensis* was recorded.

The genus *Rexa* NAVÁS comprises also two species: *R. lordina*, westmediterranean and *R. raddai*, eastmediterranean (map 7). There is still one genus which is restricted to a small part of the Palearctic Region: *Atlantochrysa* HÖLZEL. This small group comprises three species (*atlantica*, *pseudoatlantica* and *sororcula*) which are endemic in the Canaries and Madeira. Finally there is the genus *Tjederina* HÖLZEL with only one species. – *T. gracilis*.



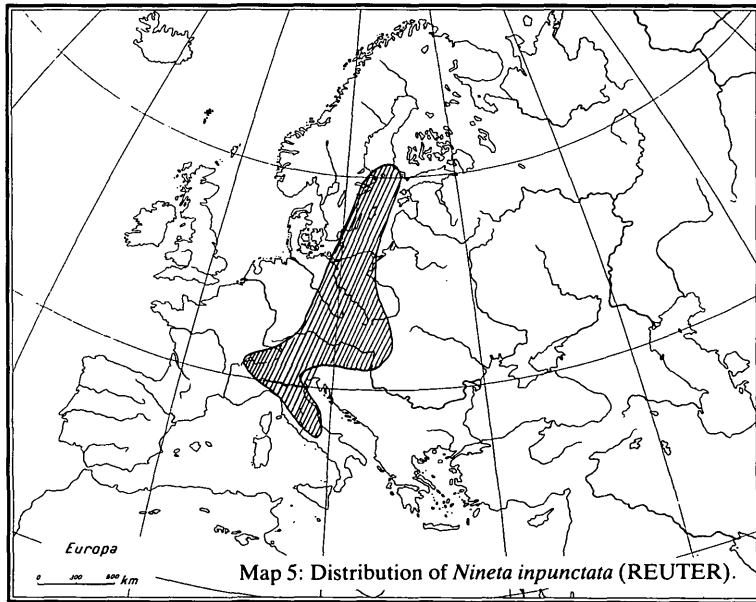
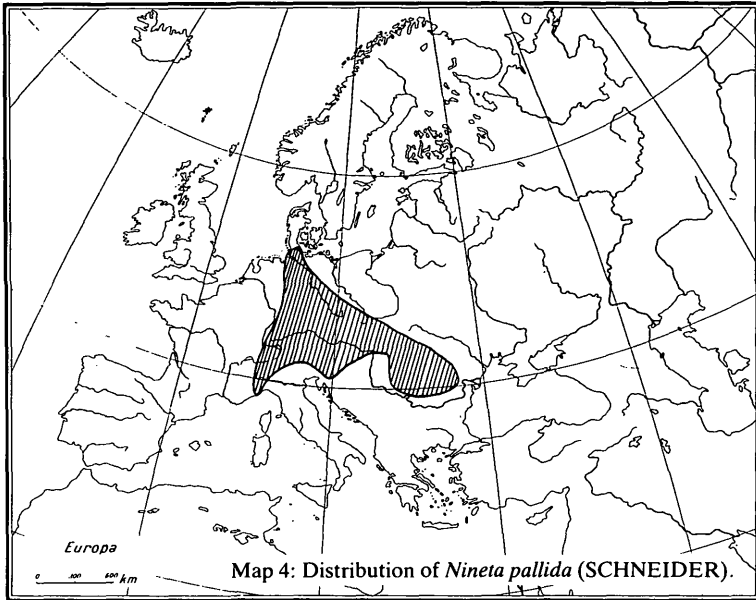
The distribution pattern is rather peculiar: Central and South Europe, Anatolia and North Africa. In Europe the species shows a strongly marked preference for firs, in Africa it has been found associated with cedars (map 8).

Now we have to deal with six genera which are not only distributed over parts of the Palearctic but also over other regions. The largest group represents the genus *Anisochrysa* NAKAHARA, dispersed over most continents. In the Palearctic Region we know at present 29 species. The better half of them – exactly 15 – are elements of mediterranean distributional centers, no less than five of them western mediterranean. In Central Europe we find only four species (*prasina*, *ventralis*, *flavifrons*, *inornata*), in Great Britain and in South Scandinavia only three (the same without *inornata*). From the Canary Islands and Madeira we know three endemic species: *A. sensitiva* from Madeira, *A. subcostalis* and *A. fortunata* from the Canaries. In the last years eight species have been described from Afghanistan and Iran, these



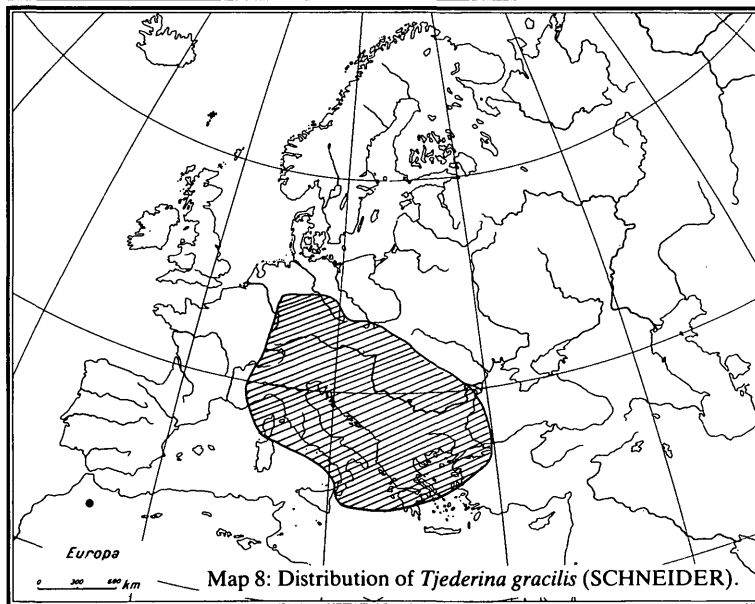
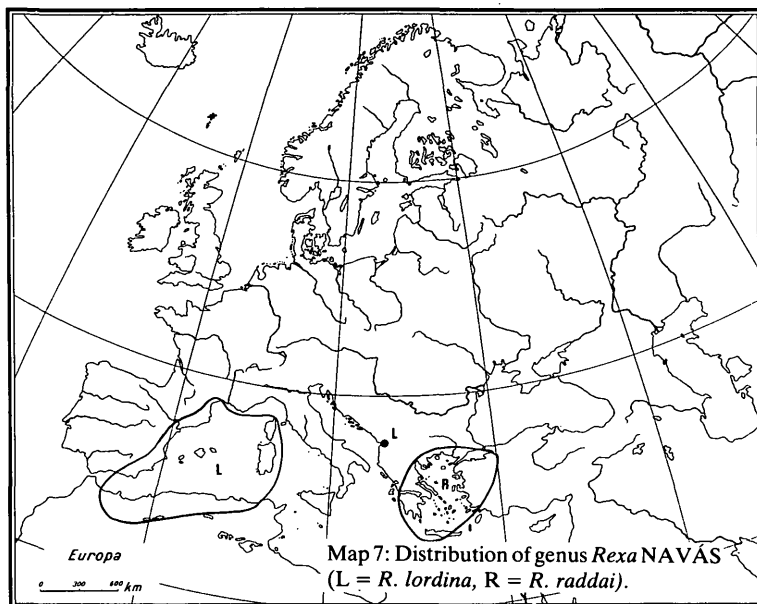
are most probably elements of eremian distributional centers (and likewise the three species which hitherto have been found in the Arabian Peninsula). In the Eastern Palearctic this genus is represented with only two species, one of them *A. boninensis* is an oriental element and *A. prasina* a polycentric siberian-mediterranean element. Strictly speaking there should be added that a few species which are known from Japan as *Chrysopa* sp. were not examined until yet and may probably belong to *Anisochrysa*, too. How many of *Anisochrysa* species described from Nepal are endemic is at present uncertain; at least two of the hitherto known nepalese species were found in India and Micronesia too. Owing to the lack of revision of the oriental and australian chrysopid fauna we do not know how many species in these regions belong to *Anisochrysa* (map 9).

Well known and dispersed over nearly the whole inhabited world (probably lacking only in the Australian Region) are the species of the genus *Chrysoperla* STEINMANN. In the



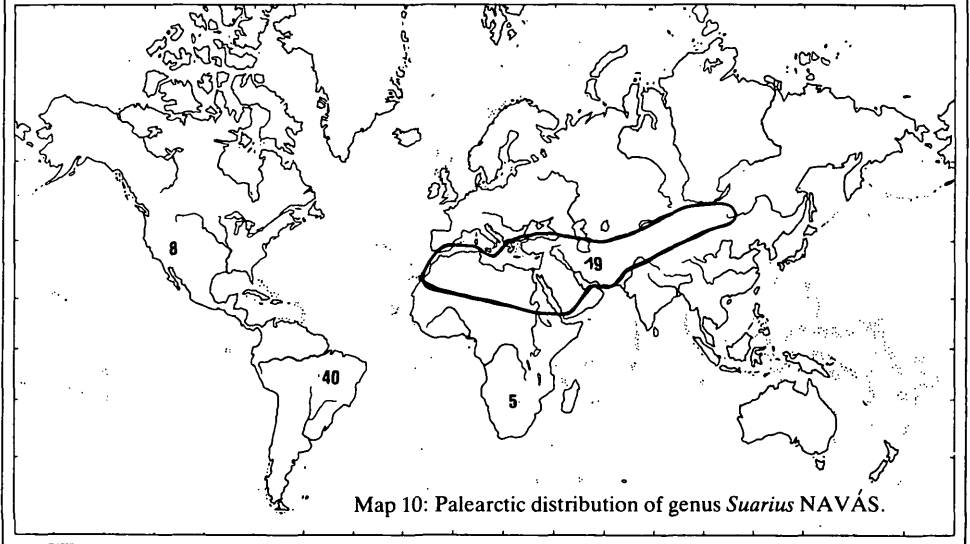
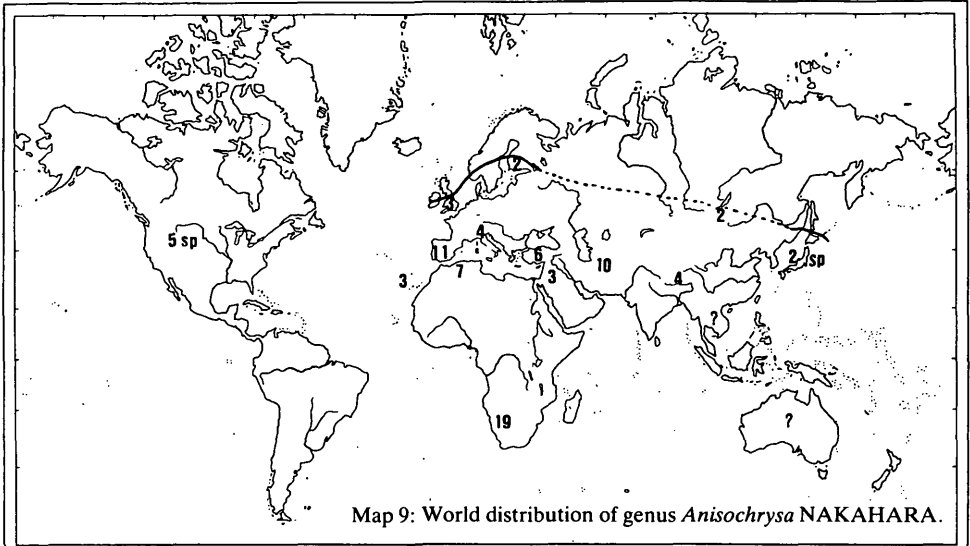
Palearctic Region this group is represented with eight species. To it belongs the best known *Chr. carnea* which has been found in nearly all continents and in many isolated islands. Two species (*mediterranea* and *mutata*) are mediterranean elements, two (*concinna*, *iranica*) were found in Iran and Saudi Arabia and represent very probably elements of eremian distributional centers; from the East Palearctic three species are known: *nipponensis* in Japan, *sinica* in China and *obliata* in Nepal; from Japan *Chr. furcifera* is recorded too, it represents an oriental element.

19 species of the genus *Suarisus* NAVÁS are at present recorded from the Palearctic Region. In all probability only one of them (*S. nanus*) represents an element of an arboreal



distributional center (it shows ponto-mediterranean distribution), the better part of the other species seems to belong to eremian distributional centers. On map 10 only the palearctic area of distribution is drawn; the genus is recorded also from South Africa (5 species) and from America (48 species). It seems to be lacking in the Oriental and Australian Region.

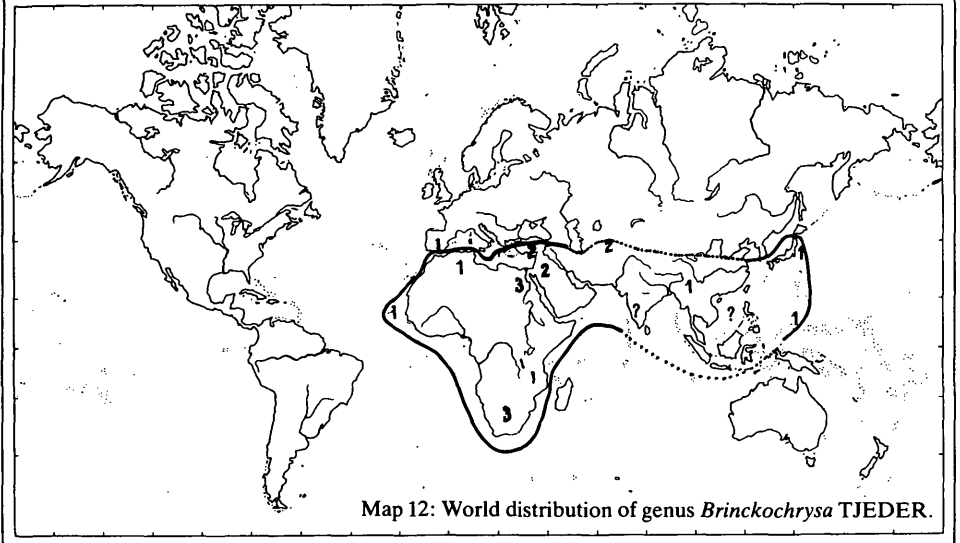
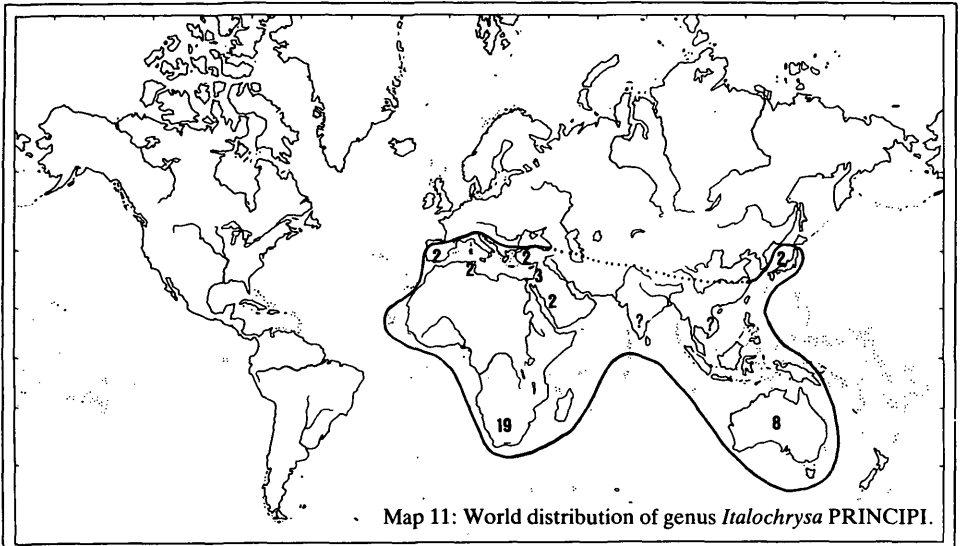
Some genera with a wide range of distribution in the Old World reach the Palearctic only marginally. The best known of them is *Italochrysa* PRINCIPI, comprising about 50 described species which are dispersed over Ethiopian, Oriental and Australian Region. We know at present nine palearctic species: two were only found in East Asia (*japonica*, *nigrovenosa*), two are probably endemic in the Himalaya mountains (*stitzi*, *talaverae*), one recently detected in



Saudi Arabia (*asirensis*) and four are known in the mediterranean region (*italica*, *vartianorum*, *bimaculata*, *stigmatica*), the last one probably being an element of an eremian distributional center, distributed from Afghanistan over Arabia and North Africa to South Spain (map 11).

*Brinckochrysa* TJEDER is distributed over Ethiopian and Oriental Region; nine species were hitherto described, five of them are palearctic elements: *Br. nachoi* recently detected in South Spain, *Br. alferii* known from North Africa, *Br. amseli* and *naumanni* described from Afghanistan and *Br. kintoki* known from Japan. One ethiopian species (*Br. michaelsoni*) was recently found in North Africa, Anatolia and Greece, too (map 12).

There remains to be mentioned the genus *Apertochrysa* TJEDER with one described species in Africa, one in Nepal and one in Afghanistan. The taxonomical status of this group is rather uncertain and the knowledge of its distribution therefore incomplete.



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