

# The genus *Glischrochilus* in The Netherlands (Coleoptera: Nitidulidae)

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**Abstract:** *Glischrochilus quadrisignatus*, originating from North America, is reported for the first time from The Netherlands. The first record dates from 1979 and at present the species is known from the northern, eastern and southern parts of the country. Distribution maps for all four species of *Glischrochilus* in The Netherlands are presented. Some notes on habitat, phenology and ecology are made.

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## Introduction

The genus *Glischrochilus* Reitter comprises five species in Europe (Audisio, 1993), of which *G. quadrisignatus* (Say) originates from North America (Spornraft, 1972). Until now three species were known from The Netherlands, viz. *G. quadripunctatus* (Linnaeus), *G. quadriguttatus* (Fabricius) and *G. hortensis* (Fourcroy) (Brakman, 1966; Huijbregts & Krikken, 1985, 1988).

*Glischrochilus quadrisignatus* was first discovered in Europe in the surroundings of Berlin in 1948 (Spornraft, 1972). Hereafter the species has rapidly dispersed over Eastern Europe (former DDR, Czechia, Slovakia, Poland, Austria, Slovenia, Croazia, Serbia, Hungary, Romania, Bulgaria and western Russia (Nüssler, 1973; Lompe, 1976; Audisio, 1980, 1985, 1990; Jelínek, 1984; Balarin, 1984; Koval, 1987). Since 1985 and 1986 respectively, *G. quadrisignatus* is known from (northeastern) Italy and Switzerland (Audisio, 1993). Dispersal in a western direction was not noticed until recently when the species was reported from former West Germany (Spornraft, 1992; Wagner, 1993); however, three specimens were already collected in 1955, 1957 and 1966 respectively, but all others (88) dated from 1985 or later (Wagner, 1993).

A revision of the Dutch *Glischrochilus* material revealed that *G. quadrisignatus* was found in 1979 for the first time in The Netherlands.

## Material and methods

The material of this study includes the collections of the National Museum of Natural History, Leiden (NNM), the Zoological Museum, Amsterdam (ZMA), the Natural History Museum, Maastricht, the Natural History Museum, Tilburg, the Department of Entomology of the Wageningen Agricultural University (WAU) and the Plant Protection Service, Wageningen (PD), and the private collections of the late Chr. Berger (Achel), H. Edzes (Nijmegen), G. van Ee (Haarlem), Th. Heijerman (Wageningen), B. van Maanen (Wageningen), P. Poot (Maastricht), O. Vorst (Utrecht) and the authors.

The distribution of the *Glischrochilus* species in The Netherlands is plotted in the 10 km-squares of the UTM-grid in which small dots refer to records before 1950 and large dots to records since 1950. The maps are based on specimens, identified by the authors.

Data on habitat are mainly based on the authors' observations as labelling of the older material in collections is mostly insufficient.

The authors' data on habitat are, however, only a minor part of all data. Data on phenology are derived from all available material.

### Identification

The four Dutch species of *Glischrochilus* are quite easily to identify on the basis of the body form, and the colour and the dimensions of the four spots on the elytra. These spots are yellow-orange in *G. quadripunctatus* and *G. hortensis*, while they are yellow-white in *G. quadriguttatus* and *G. quadrisignatus*. The anterior spots are small in *G. hortensis* and *G. quadriguttatus* and large in the other two species. The outline of the anterior spots is deeply incised in *G. quadriguttatus* and more or less regular in the other three species. The body of *G. quadripunctatus* is distinctly more depressed than that of the other species. One is referred to Spornraft (1972, 1992) and especially Audisio (1993) for further characteristics and figures of elytral patterns. These publications also give figures of the main sclerites of the internal sac of the aedeagus, which can be decisive for the distinction between *G. quadrisignatus* and *G. hortensis*.

Males and females of *G. quadrisignatus* can be distinguished on the basis of a different number of teeth on the mandibles: males have three small teeth, while females have only two (Bolter & Stewart, 1991).

### Distribution, habitat and phenology

*Glischrochilus quadripunctatus* (Linnaeus)  
(figs 1, 5)

*Glischrochilus quadripunctatus* is recorded from 33 squares since 1950 and additionally from 14 squares before 1950 (fig. 1). In 11 out of 47 squares the species is recorded in both periods. The distribution of *G. quadripunctatus* is mainly confined to the southern, central and eastern part of The Netherlands. Especially in Zuid-Limburg, the southern part of Noord-Brabant and on the Veluwe the species is not rare. From the western part of The

Netherlands there are only old records from Den Haag (1911) and Loosduinen (last record: 1920), while the species is lacking in the northern part. *Glischrochilus quadripunctatus* is known from all Dutch provinces except Groningen, Flevoland and Zeeland.

The distribution of *G. quadripunctatus* comprises nearly the whole Palaearctic area with exception of the extreme north and south (map with European distribution in Audisio, 1993).

The larvae and adults of *G. quadripunctatus* typically live behind the bark of conifers (*Pinus* sp., *Abies* sp., *Picea* sp., *Larix* sp.), where they feed on fermenting sap and on fungi in the tunnels of large scolytid beetles (Koch, 1989; Audisio, 1993). Adults are attracted to chips of newly cut spruce (*Picea*) stems as well as stems stored over winter by released volatile constituents (Lindelov et al., 1992). Especially combinations of ethanol and alpha-pinene were very attractive to *G. quadripunctatus* (Schroeder, 1988; Schroeder & Lindelov, 1989). The occurrence of *G. quadripunctatus* behind bark of deciduous trees (*Fagus sylvatica* L., *Betula* sp., *Quercus* sp.) is much less common (Koch, 1989). Occasionally adults are found in macrofungi and fermenting fruits at the edges of forests (Audisio, 1993). The few Dutch data confirm the frequent occurrence behind the bark of *Pinus sylvestris* L. (five times), but also behind the bark of deciduous trees (*Fagus sylvatica*: three times; *Betula* sp.: once) is relatively often mentioned. However, in the last situations the deciduous trees were always amidst of *Pinus* plantations. Two specimens were taken respectively in flight and indoors behind a kitchen window.

The distribution pattern of *G. quadripunctatus* in The Netherlands fairly well agrees with the distribution of large *Pinus sylvestris* plantations, the preferred habitat.

*Glischrochilus quadripunctatus* can be found all over the year (fig. 5) with two distinct maxima from March-June and September-October. Audisio (1993) mentions the period April-November as the main activity period of the adults, while larvae are present from May-August.

*Glischrochilus hortensis* (Fourcroy)  
(figs 2, 6)

*Glischrochilus hortensis* is the most common and most widespread *Glischrochilus* from The Netherlands. It is recorded from 96 squares since 1950 and additionally from 26 squares prior to 1950 (fig. 2); in 19 squares it is recorded in both periods. *Glischrochilus hortensis* is the only *Glischrochilus* known from all Dutch provinces.

The distribution of *G. hortensis* comprises the Palaearctic region with the exception of the extreme north and south (map with European distribution in Audisio, 1993).

Adults and larvae of *G. hortensis* are mainly reported from fermenting and decomposing fruits and vegetables, decaying macrofungi and fermenting sap from damaged or (recently) cut-off deciduous trees in or at the edges of deciduous forests (Koch, 1989; Audisio, 1993). The available Dutch data reflect this range of habitats: in macrofungi (fungi on soil as on trees are included: eight times), in a decaying *Pinus sylvestris*-trunk (once), on fermenting sap of recently cut *Betula*- (once) and *Pinus*-trunks (once), hibernating behind a treeband around an apple tree (once), in and under decaying roots of *Brassica* (once) and on ripe strawberries (twice). On several occasions flying specimens were observed; sometimes these flights were observed to end unintentionally in ditches (once). A very remarkable observation was the aggregation of about 15 specimens of *G. hortensis* under a dead *Carabus*-beetle in the dunes of Cape Gris-Nez (France) on 24 September 1994 (B. van Maanen, personal communication). The distribution of the species in The Netherlands is in accordance with the wide range of observed habitats. A restriction to deciduous forests (Audisio, 1993) is not observed in The Netherlands, though *G. hortensis* is more often observed in or at the edges of forests (both coniferous as deciduous) than in open country.

*Glischrochilus hortensis* is recorded from March - September in The Netherlands with a maximum from April - June (fig. 6). The very few observations from October - February are,

in comparison with the other *Glischrochilus* species, remarkable, taking in account the large number of records. Audisio (1993) mentions an activity period from April - October, with a re-productivity period from June - September.

*Glischrochilus quadriguttatus* (Fabricius)  
(figs 3, 7)

*Glischrochilus quadriguttatus* is recorded from 29 squares since 1950 and additionally from 12 squares prior to 1950; in 5 squares it is recorded in both periods. *Glischrochilus quadriguttatus* is mainly confined to the southern, eastern and central part of The Netherlands. There are only three records from the western part of The Netherlands (Domburg, 1909; Oostkapelle, 1948; Amsterdam, 1982) and two from the northern part (Schipborg, 1988; Friesche Veen bij Paterswolde, 1994). *Glischrochilus quadriguttatus* is known from all Dutch provinces except Friesland, Groningen, Flevoland and Zuid-Holland; despite the report from the last province by Brakman (1966) we could not find any material in the collections.

The distribution area of *G. quadriguttatus* extends from Ireland in the west to the Ural mountains in the east and from southern Scandinavia to the north of the mediterranean area (map in Audisio, 1993). Despite its large distribution area *G. quadriguttatus* seems to be rather rare in Europe (Audisio, 1993), which is also true for The Netherlands.

Larvae and adults of *G. quadriguttatus* are typically found on trunks of deciduous trees (many genera), where they mainly feed on fermenting sap and, for a smaller part, on the larvae of xylophagous insects (Cossidae, Cerambycidae, Buprestidae) (Koch, 1989; Audisio, 1993). Adults are also frequently observed behind bark, feeding on subcortical fungi and on fruitbodies of arboreal macrofungi. The occurrence behind bark of coniferous trees is rare. Fermenting fruits, decomposing fruitbodies of terrestrial macrofungi and beer- and vinegar-traps are also very attractive for adult *G. quadriguttatus* (Koch, 1989; Audisio, 1993). The few Dutch data confirm the occurrence behind

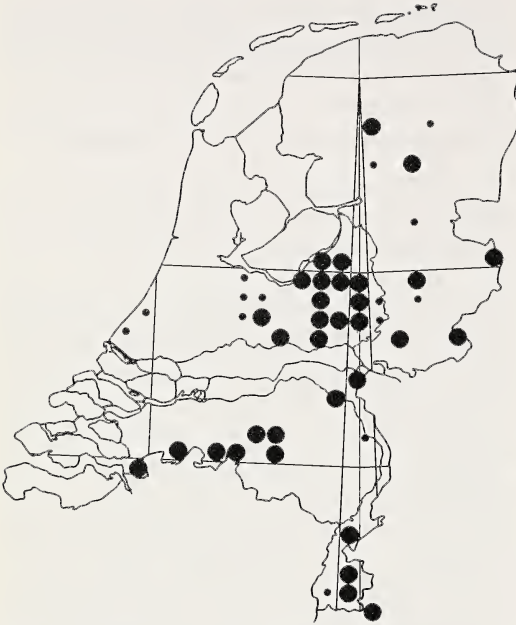


Fig 1. Distribution of *Glischrochilus quadripunctatus* in The Netherlands. Small dots: records prior to 1950; large dots: (also) records since 1950.



Fig. 2. Distribution of *Glischrochilus hortensis* in The Netherlands.

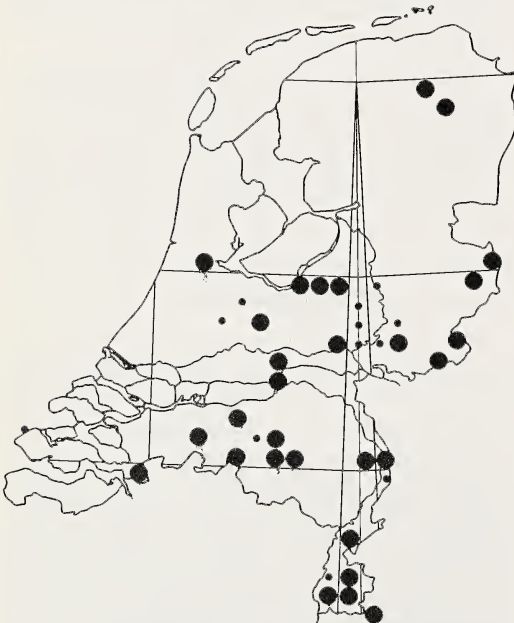


Fig. 3. Distribution of *Glischrochilus quadriguttatus* in The Netherlands.

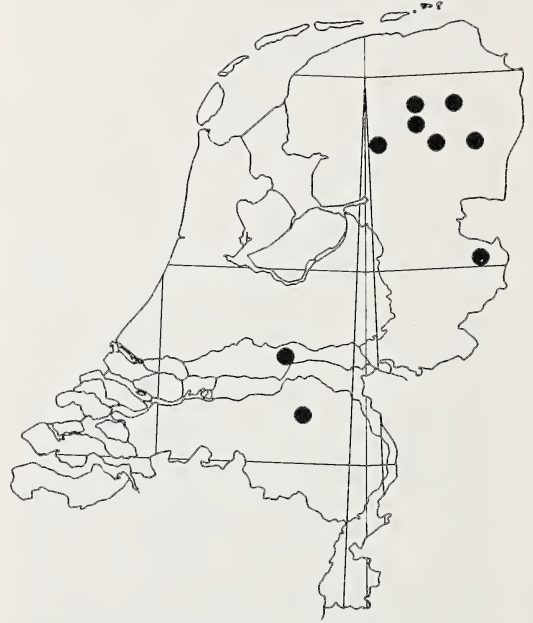
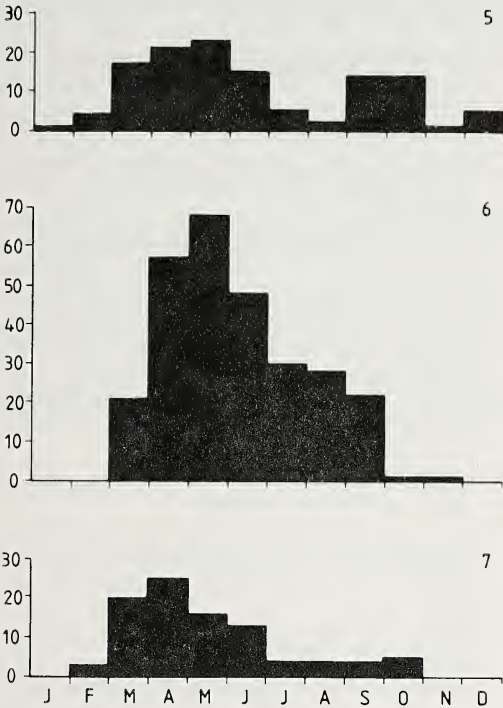


Fig. 4. Distribution of *Glischrochilus quadrisignatus* in The Netherlands.



Figs 5-7. Phenology (number of records) of *Glischrochilus* in The Netherlands. 5, *G. quadripunctatus*; 6, *G. hortensis*; 7, *G. quadriguttatus*.

bark of deciduous trees (*Populus x canadensis* Moench, once; *Alnus glutinosa* (L.) Gaertner, once; *Fagus sylvatica*, once). The species is occasionally taken in flight and once, in numbers, in a bee-hive consisting of synthetic material (together with *G. quadrisignatus*).

*Glischrochilus quadriguttatus* has been found in The Netherlands from February - October with a clear maximum from March - June (fig. 7). The data are in agreement with Audisio (1993) who mentions March - October.

*Glischrochilus quadrisignatus* (Say) (fig. 4)

Material

Friesland: Ooststellingwerf, Appelscha, Ravenswoud, under *Brassica* turnips, 27 ♂, 5 ♀, 12.v.1994, J.G.M. Cuppen; Weststellingwerf, Noordwolde, Zandhuizen, inside tent, 2 ♀, 14.viii.1994, P. Poot; idem, 2 ♂, 10.viii.1995, P. Poot; Groningen: Leek, Zevenhuizen, Haspelerwijk, floating in canal, ♀, 11.ix.1983, J.G.M. Cuppen;

Drenthe: Odoorn, Exloo, Witte Vledder, floating in canal, ♀, 7.v.1983, J.G.M. Cuppen; Smilde, under *Statice* plants, 2 specimens, 17.viii.1986, Plantenziektenkundige Dienst; Anloo, Schipborg, bee-hive of synthetic material, 3 specimens, 18.x.1988, Plantenziektenkundige Dienst; Beilen, Hooghalen, Heuvingerzand, fermenting sap on *Betula*-stump, 6 ♂, 4 ♀, 14.v.1994, J.G.M. Cuppen; Overijssel: Ootmarsum, mixed forest, ♂, 9.x.1979, J. Huijbregts (NNM); Gelderland: Buren, Erichemsewal, orchard "De Goei", behind tree-band, ♀, 22.i.1994, L. Blommers; Noord-Brabant: Heeswijk-Dinther, in forest, ♂, 7-9.viii.1986, H.T. Edzes.

*Glischrochilus quadrisignatus* is recorded from 9 squares in six provinces since 1979 in the northern, eastern and central part of The Netherlands (fig. 4). Apart from the records in Friesland and most records in Drenthe all other data concern single migrating or hibernating specimens.

The original distribution area of *G. quadrisignatus* comprised the central and eastern part of North America. At present the distribution area of *G. quadrisignatus* comprises also Central and East Europe. The species is not known from Scandinavia, Great Britain, France and the mediterranean area. The slow westwards dispersal of *G. quadrisignatus* since its introduction near Berlin in 1948 is strikingly different from its fast dispersal in the south-eastern direction.

*Glischrochilus quadrisignatus*, the picnic beetle, can be found under the bark of deciduous trees (especially *Quercus* sp.) and on the fruitbodies of decaying macrofungi (Audisio, 1993). In North America it is often reported as a serious pest in agriculture (especially cultures of raspberries, strawberries, tomatoes and maize) (Miller & Williams, 1981; Audisio, 1985). In Europe damage to crops seems to be less common. In general all decomposing material that releases ethanol seems to be attractive for *G. quadrisignatus*. In pitfall-traps with ethanol the species is occasionally collected in large numbers (Wagner, 1993).

The few Dutch data suggest that adults of *G. quadrisignatus* can be found the whole year round. Audisio (1993) reports adults from February - November.

## Discussion

*Glischrochilus quadrisignatus* was first discovered in Europe near Berlin in 1948 (Spornraft, 1972). However, the species was until recently (Spornraft, 1992; Audisio, 1993) not included in the most often used identification keys. During the revision of the Dutch *Glischrochilus* material some recent records of *G. quadrisignatus* in Nordrhein-Westfalen close to the Dutch border were published by Wagner (1993). The presence of *G. quadrisignatus* in The Netherlands fairly well fits in the recent extension of its distribution area. Since 1979 the species has been found on several occasions. The most common species of the genus *Glischrochilus* in The Netherlands was and is *G. hortensis*. *Glischrochilus quadripunctatus* and *G. quadrisignatus* are nowadays equally common. *Glischrochilus quadriguttatus* is, like in the past, the rarest of the Dutch *Glischrochilus* species.

*Glischrochilus quadrisignatus* has a bad reputation in North America being a pest insect in especially fruit cultures and maize fields. Despite its great expansion in Europe, damage to crops seems to be very rare. However, with 7% of the country covered by monocultures of maize, the beetle may wait a fruitful future.

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