

# Betrachtungen von Buse (2012): Cryptorhynchinae als Geister der Vergangenheit

Christoph Germann

## “Ghosts of the past”: flightless saproxylic weevils (Coleoptera: Curculionidae) are relict species in ancient woodlands

Jörn Buse

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**Abstract** Historic maps show that the Central European landscape was influenced by exploitive human land-use during the middle ages and in the following centuries. A mixture of ancient woodlands, which survived the period of woodland destruction, and recent woodlands, which were established after 1800, cover about 10% of the study area in NW Germany today. Weevils (Coleoptera: Curculionidae) of the subfamily Cryptorhynchinae with the genera *Acalles*, *Kyklioacalles*, *Ruteria* and of the subfamily Molytinae, tribe Acicnemidini with the genus *Trachodes* are all flightless and possibly influenced by landscape history. The aims of this investigation are (1) to examine the spatial distribution of flightless saproxylic weevils in ancient and recent woodlands in NW Germany and (2) to test the frequency of possible relict species in relation to historical and current woodland size. Based on a field study in 29 deciduous woodlands and species records in collections and literature, six flightless saproxylic weevils were found to be associated with ancient woodlands in NW Germany. None of these were recorded in any of the 14 recent woodlands studied. The frequency of these relict species is correlated with historical, but not with current, woodland size. Distribution maps for Lower Saxony and data on the phenology of the relict species are presented. These weevils are relict species of ancient woodland, because they were unable to colonise isolated woods that were established after 1800. All of them are dependent on dead or dying wood for larval development. The results show that

continuity are of high conservation value for invertebrate species such as saproxylic weevils.

**Keywords** Cryptorhynchinae · Molytinae · Habitat continuity · Dispersal · Landscape history · Woodland continuity

### Introduction

Past landscape history and connectivity is known to affect the present pattern of species distribution and community composition (Lindborg and Eriksson 2004; Taboada et al. 2006). The landscape of north-western Central Europe, for instance, has been intensively influenced by human activities since the early Neolithic era, i.e. since about 5000–4000 BC. In NW Germany overexploitation of woodlands by clearing, charcoal burning and intensive grazing especially during the Middle Ages, led to small fragmented and degraded woods (Hesmer and Schroeder 1963; Pott and Hüppe 1991). Many other European regions experienced similar landscape history, as reported for Britain (Rackham 2003) and for the Netherlands (Dirx 1998). Woodlands that have been continuously wooded since the first maps were available, e.g. 1600 AD in Britain, are known as ancient woodlands (Peterken 1981). The exact definition of what constitutes an ancient woodland depends on the availability of such maps, but a minimum of 200 years is

Infos:

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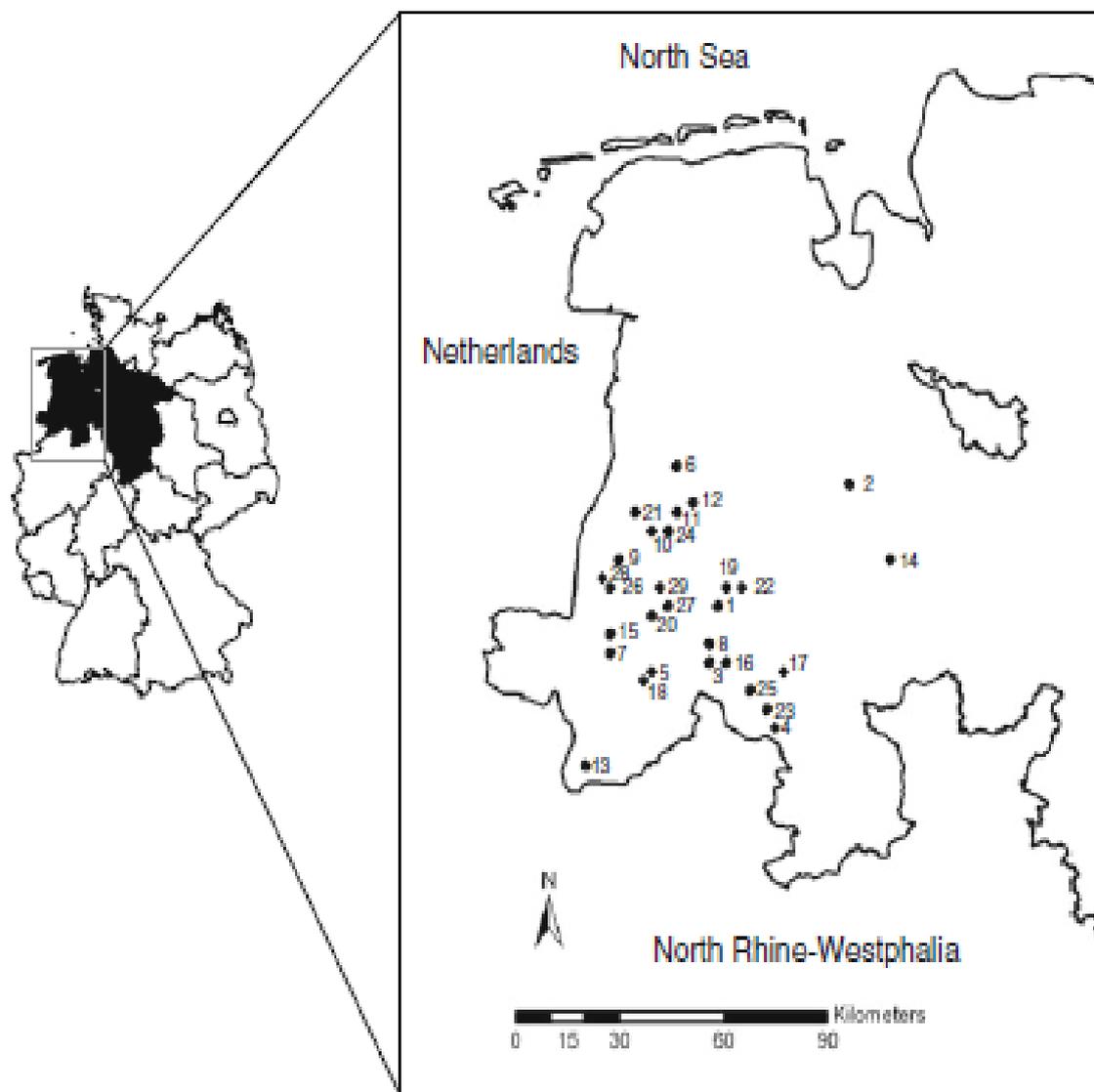
Basis der Studie:

alte Wälder: auf Karten von 1764-1786 bereits eingezeichnet, also mind. 220 Jahre alt.

Feldarbeit: Gesiebeproben in Stammnähe, immer von alten Eichen UND Buchen. Auslese im Gebiet (...)

Im Vergleich: 15 alte und 14 neue (=unbewaldet bis Ende 18. Jahrhundert) (Laub)-Wälder in Nordrhein-Westfalen

**Fig. 1** The study area and locations of the studied woodlands (*black dots*, cf. Table 1). The region is located in the federal state of Lower Saxony (marked in *black* on the left) in NW Germany



# Resultate:

**Table 1** Woodlands studied in the Weser-Ems region and woodland size around 1800 and 1990

Woodlands studied	Size ca. 1990 (ha)	Size ca. 1800 (ha)	Ancient woodland	Recent woodland	<i>Acalles pinoideis</i>	<i>Trachodes hispidus</i>	<i>Kykliaacalles navieresi</i>
1	Borstel	1,800	110	OB	-	-	-
2	Baumweg	1,500	400	OB	-	x	x
3	Lonner Tannen	1,250	120	OB	-	-	-
4	Geln	1,200	530	OB	-	x	-
5	Baccumer Wald	840	200	OB	-	-	-
6	Bürgerwald	380	320	OB	-	-	x
7	Wachendorf	280	30	OB	-	-	-
8	Sültholz	150	220	OB	-	-	-
9	Tinner Loh	120	50	OB	-	-	-
10	Sprakeler Holz	90	30	OB	-	-	x
11	Sögeker Gehölz	60	40	OB	-	-	x
12	Spahner Südholz	50	20	OB	-	-	-
13	Bentheimer Wald	1,000	1,100	OH	-	x	-
14	Herrenholz	570	660	OH	-	-	x
15	Biener Busch	80	90	OH	-	-	x
16	Maiburg	950	-	-	OB	-	-
17	Rüsseler Holz	690	-	-	OB	-	-
18	Mundersumer Sand	670	-	-	OB	-	-
19	Ehrener Wald	350	-	-	OB	-	-
20	Wester Schafdrift	280	-	-	OB	-	-
21	Wahner Tannen	250	-	-	OB	-	-
22	Tannenkamp	170	-	-	OB	-	-
23	Bührener Wald	100	-	-	OB	-	-
24	Egels	113	-	-	OB	-	-
25	Rocksberg	65	-	-	OB	-	-
26	Borkener Paradies	30	-	-	OB	-	-
27	Neuer Grund	21	-	-	OB	-	-
28	Abbemühlen	40	-	-	OH	-	-
29	Bückelte	15	-	-	OH	-	-

Woodlands were classified into two forest types following the classification in Assmann (1999), who studied ground beetles in these woodlands: OB = Oak-beech type, OH = Oak-hornbeam type. Species records were made by sifting litter with small dead twigs in April 2009

## Resultate:

NUR Arten:

- *Acalles ptinoides* (3 Funde)
- *Trachodes hispidus* (6 Funde)
- *Kykliaoacalles navieresi* (1 Fund)

ALLE 10 Exemplare NUR in alten Wäldern...

Also zusätzlich (etwas stark Sammler-basierte) Sammlungsdaten:

**Table 2** Number of records of *Acalles*, *Kyklioacalles*, *Ruteria* and *Trachodes* species currently known from the Weser-Ems region, except *A. ptinoides*, and their association with ancient woodlan

Species	Ancient woodland or adjacent to ancient woodland	Recent woodland
<i>Acalles camelus</i> (F., 1792)	2	0
<i>Acalles echinatus</i> (Germ., 1824)	4	0
<i>Acalles fallax</i> Boh., 1844	1	0
<i>Kyklioacalles navieresi</i> (Boh., 1837)	1	0
<i>Ruteria hypocrita</i> (Boh., 1837)	1	0
<i>Trachodes hispidus</i> (L., 1758)	18	0

All species except *A. ptinoides*, which is known to feed also on *Calluna*, are dependent on trees for larval development

## Fazit:

- Auslesemethode IM Feld extrem wenig ergiebig!
- Möglichkeit des NICHT ERKENNENS ist immens!
- Denn auch: Extrem wenige Arten! In extrem wenigen Individuen!
- Arten: *Acalles ptinoides* kann auch in stark degradierten „Wäldern“, bzw. Heiden und unter Ginsterbeständen ohne jeden Waldanstoss gefunden werden (eigene Daten)
- *Kyklioacalles navieresi* kommt auch in stark degradierten Wäldern/Gehölzen vor.
- So bleiben lediglich die Funde von *Trachodes hispidus* (6 Exx.) und die Sammlerbasierten Daten der weiteren Arten (welche jedoch logischerweise NUR in spannenden alten Wäldern gewonnen wurden...)

**Sehr schwache (und leider einzige peer-reviewte) Basis zur Stützung der Cryptorhynchinae (- und Molytinae) als Indikatorgruppe für Alte Wälder bei uns!**

**Idee der Wiederholung des interessanten Ansatzes in schweizerischen Wäldern?**

**- Karten?**

**- geeignete Wälder?**

**- Käferarten:**

## **Situation Schweiz**

- **Acalles camelus**
- **A. dubius**
- **A. echinatus**
- **A. fallax**
- **A. lemur lemur**
- **A. micros**
- **A. parvulus**
- **A. temperei**
  
- **Echinodera hypocrita**
  
- **Kyklioacalles aubei**
- **K. navieresi**
- **K. roboris**
  
- **Onyxacalles pyrenaeus**
  
- **Neoplinthus caliginosus...? Rutidosoma?**

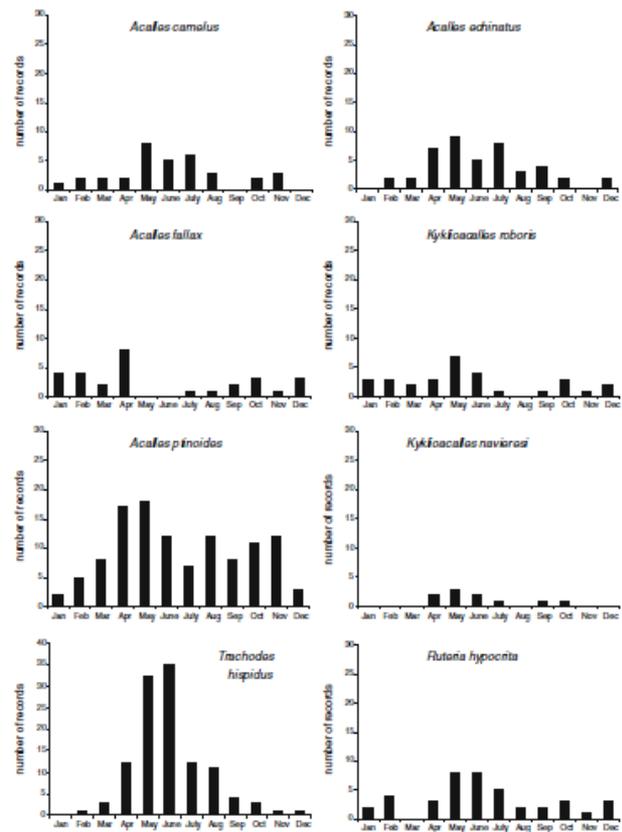


Fig. 3 Phenology of *Acalos*, *Kykioacalis*, *Rutaria*, and *Trachodes* species based on records taken from 1945 to 2010 in Lower Saxony by different collecting methods (beating, sifting, pitfall trapping)

## Discussion

Data obtained from collections, literature, and a field study in 29 woodlands showed that at least seven flightless saproxylic weevils are relict species of ancient woodland in NW Germany. These ancient woodlands have been continuously wooded for at least the last 220 years, as indicated by historical maps. Species richness of saproxylic beetles is positively correlated with stand size and age of woodlands (Imler et al. 2010). Even woodlands that were relatively small at the end of the eighteenth century (e.g. Sögeler Gehölz 40 ha, Spinkeler Holz 30 ha) are suitable to host relict weevil species. However, saproxylic flightless weevil species were more frequent in ancient woodlands that were relatively large 200 years ago. It is difficult to draw a critical threshold of woodland size for the survival of relict weevils from the data, but more than one relict species was found in woodlands that covered a minimum of 100 ha. In most cases woods that contained relict species covered hundreds of hectares.

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