The variability of the forceps in the male common Earwig, Forficula auricularia L. (Dermapt.)

by

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A large variability in the individual size of chitinous appendices (jaws and cephalic horns) is found in the males of many species of Insects, chiefly in the Coleoptera. In the male Earwig the size of the forceps shows considerable variation.

As early as 1853 FIEBER mentioned two, so-called varieties: *Forficula auricularia* var. *macrolabia* (= *forcipata*) and *F. a.* var. *cyclolabia*, the first with a long forceps (5—8 mm), the second with a short one (2.5—5 mm).

BATESON & BRINDLEY (1892) observed, that the ratio of "high males" and of "low males" (as they called the individuals with long and short callipers respectively) may vary considerably with the site where the specimens are collected. These authors found a bimodal curve for the length of the forceps in male Earwigs caught on the Farne Islands off the coast of Northumberland.

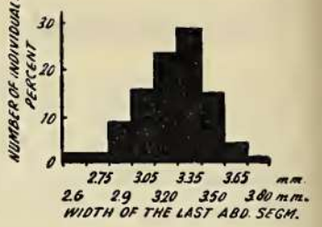
DIAKONOW (1925), investigating an Earwig population near Perm (Russia), concluded that the difference in the size of the forceps has no genetic origin, but is due to environmental influences (temperature, humidity and food abundance). With great difficulty he succeeded in raising about 30 Earwigs, whose male parents were all "high", but which all proved to be "low".

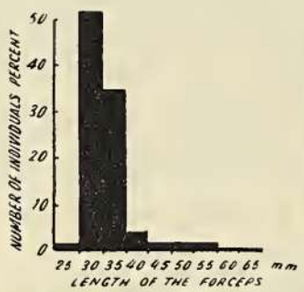
In 1928 KUHL published a series of observations on this subject, chiefly based on specimens collected at Heligoland and Frankfurt a.M. He found a unimodal curve for the variability of the length of the forceps and in his opinion the number of Forficules measured by BATESON & BRINDLEY was too small (n = 582). On the other hand, KUHL considered the sampling method of DIAKONOW to be faulty, as the latter caught his specimens a piece by means of a pair of pincers (in which case the individuals with a long forceps are more likely to be seized), while he (KUHL) collected the Earwigs by means of bags, filled with exelsior and left overnight in suitable places. Next morning the bags were emptied in a vessel thus preventing any escape.

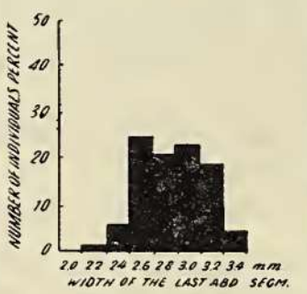
The curves of WEYRAUCH (1932) are also derived from too small a number of specimens (e.g. Dueren n = 573). Many of them are bimodal, though some show a unimodal variation. His work is criticized by KUHL (1933) as he caught his specimens also by means of pincers.

FOX-WILSON (1940) unfortunately did not make exact measurements of the size of the forcipes in the males, when he collected 5458 specimens in Wisley (England). He states the number of macrolabious forms (probably the number of individuals with a forceps at least 5 mm long) to be about 1 percent. This number being rather small, the result probably would have been a unimodal curve. Moreover, Dr. FOX-WILSON sent me a batch of 525 specimens, sampled in 1946, which confirmed this estimation. The individuals proved to be undersized, the longest forcipes measuring only 5 mm.

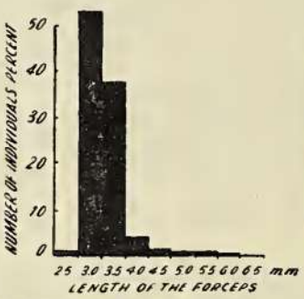
Jean LHOSTE (1943) measured the population of three localities in the

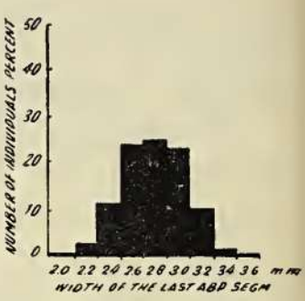




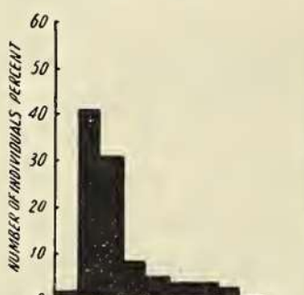


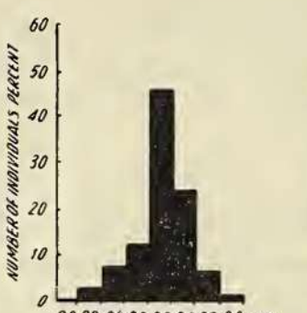
HELIGOLAND 1924 N=1052



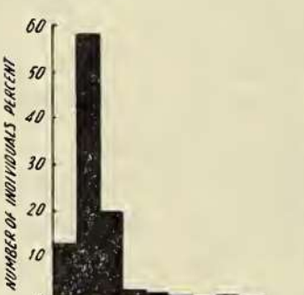


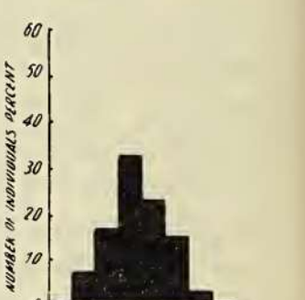
HELIGOLAND 1925 N= 1706



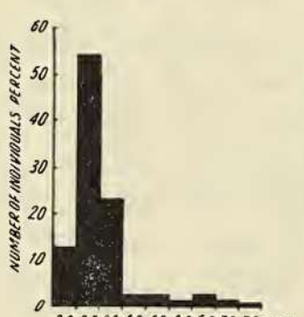


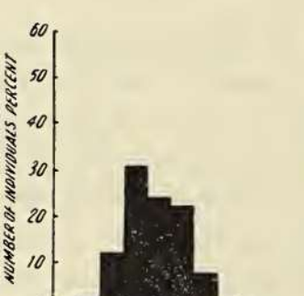
FRANKFURT A/M 1925 N=1277



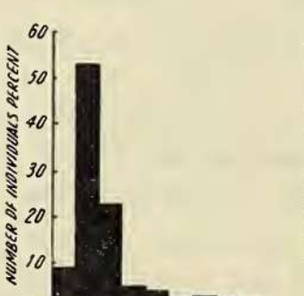


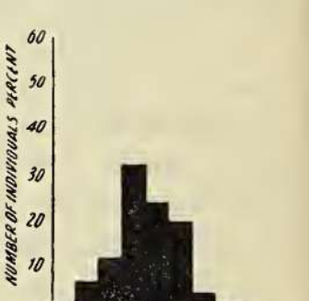
BAARN 1946 N= 859



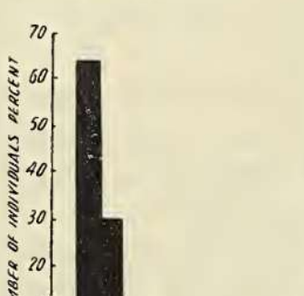


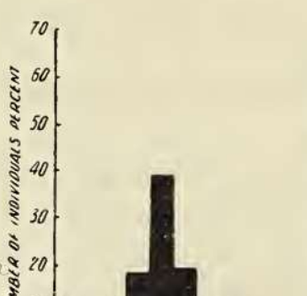
BAARN 1948 N= 775





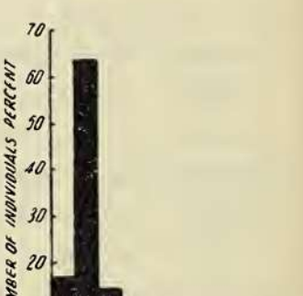
BAARN 1950 N= 1042





WISLEY 1946 N= 525

BAARN 1949 GARDEN N= 756



BAARN 'S 'G OAK BIRCH WOOD N. 762

central part of France during two subsequent years. His numbers, however, are too small (n = 125) to draw any conclusions.

It is a remarkable fact that contrary to the bimodal or strongly asymmetric unimodal curves, yielded in all cases by the length of forceps in the male, the width of the last abdominal segment, which is used as a standard for the size of the individual (the body-length being unsuitable owing to the telescoping abdominal segments), always builds up a strictly symmetric unimodal curve.

My own investigations, concerning the Earwig population of Baarn (a village in the central part of the Netherlands, about 12 miles N. of Utrecht) have been continued during the years 1945—'52 and are still in progress. The sampling method of KUHL was adopted, so that all individuals of a certain site were caught. The length of the forceps and the width of the last abdominal segment of two populations, living in different biotopes (a favourable one: a sunny flower- and kitchen-garden and an unfavourable one: a shady oak-birch wood) were measured. In the garden, the mean length of the forceps proved to be longer and the number of "high males" larger than in the wood. The curves always proved to be unimodal, though strongly asymmetric, the "low males" outnumbering the "high males" to a great extent. About 100 male third stadium larvae, bred under laboratory conditions, all turned out to be "low" after metamorphosis (which is in concordance with DIAKONOW) so the occurrence of long or short forcipes is not likely to be due to a purely genetic factor. On the other hand, a certain disposition of genetic origin to form a long forceps under favourable conditions has to be considered. Further investigations may reveal new facts on this subject.

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Catocala promissa Schiff. In Cat. Ned. Macrolepidoptera (8): (512), 1949, schrijft LEMPKE, dat *Catocala promissa* vermoedelijk een zeer zeldzame immigrant is. Als ik mijn ervaringen van dit jaar (1953) naga, begin ik daar aan te twijfelen. Van 15 Juli tot 15 Augustus werden in een eikenbos bij Apeldoorn ongeveer 30 exemplaren waargenomen! Alle gevangen exemplaren, waarbij enkele ♀♀, zijn gaaf, behalve het laatste van 15 Augustus, dat sterk afgevlogen is. Opmerkelijk is, dat van de drie op dezelfde plek voorkomende *Catocala*'s *promissa* de minst schuwe is. Het dier blijft rustig in het licht van de lantaarn op de stroop zitten en is dus niet moeilijk te vangen.

Op dezelfde plaats ving ik ook nog vijf exemplaren van *Deileptenia ribeata* Clerck en twee exemplaren van *Enargia paleacea* Esper, terwijl *Hydriomena furcata* Thunberg er gewoon is.

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