

Tartu Ülikooli Taimehaiguste-katsejaama teated nr. 26.
Report of the Phytopathological Experiment Station of the University of
Tartu in Estonia No. 26.

E. LEPIK

**ON OCCURRENCE OF ERGOT (CLAVICEPS)
IN ESTONIA**

TARTU 1935

ESTICA

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Tartu Ülikooli Kirjandus- ja Kunstiteaduskond
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On Occurrence of Ergot (*Claviceps*) in Estonia.

The older data on the occurrence of Ergot (*Claviceps*) in the Baltic countries (Estonia, Latvia and Lithuania) have been summed up in a table by F. Bucholtz (1904). The table was composed on the basis of statements by Dietrich (1856, 1859), Buhse (1866, 1870), Bondarzew (1902), Bucholtz and Kierseritzky (1904) and contains on the whole 44 hosts of the fungus.

In the table by Bucholtz, as well as in a list by Dietrich, a few old data have been overlooked, e. g., some information by Lehnert (1849) in particular. Therefore, a few hosts named by recent authors are erroneously regarded by them as new to the Baltic countries.

From a speech by Lehnert (1849) delivered at the Naturalist's Association in Riga, it is clear that the said author noticed the fungus in Kurland (Kurzeme — a province of Latvia) on the following grasses¹): *Agrostis stolonifera* L.; *Calamagrostis silvatica* Cand. (On many specimens, but always in a few Sclerotia only.); *C. stricta* Spr.; *Glyceria plicata* Fr.; *G. fluitans* R. Br. (Very often); *Molinia coerulea* Mönch (Very often, especially on the forest form *M. altissima* Hk.); *Festuca* (With the exception of *F. ovina* L. and *F. duriuscula* L. very often on all the native species of *Festuca*).

In addition it may be mentioned that at that time, according to Lehnert (cp. Fleischer, Lindemann, Flora, 1839, p. 51—53), the following species of *Festuca* were known in the Baltic countries:

Festuca arundinacea Schreb., *F. borealis* Mert. et Koch [*Scolochloa festucacea* (Wahl.) Link], *Festuca elatior* L.

¹) Cp. also Lepik (1930 p. 8 (34), No. 9 and p. 19 (45), No. 55.

(= *F. pratensis* Hud s.) *Festuca gigantea* Vill., *F. heterophylla* Lam., *F. ovina* L., *F. rubra* L., *F. silvatica* Vill.

That Lehnert noticed Ergot on *Festuca silvatica* Vill. and on *Scolochloa festucacea* (Wahl.) Link (*Festuca borealis* Merk. et Koch according to Fleischer-Lindemann) seems, nevertheless, to be questionable.

On the contrary, Lehnert seems to have met with Ergot actually on the following species of *Festuca*: *Festuca arundinacea* Schreb., *F. gigantea* Vill., *F. heterophylla* Lam., *F. pratensis* Hud s. (*F. elatior* L.), *F. rubra* L.

Therefore, Bucholtz's list of the nutritive plants of *Claviceps* should be supplemented with 4 species (*Calamagrostis stricta* Spr., *Glyceria plicata* Fr., *Festuca heterophylla* Lam. and *Festuca gigantea* Vill.) and from this it follows that, according to the older data 48 hosts of the fungus are known in the Baltic countries.

Besides, one can find a few remarks and brief reports on Ergot in the older Baltic literature (until the year 1921) by the following authors: Heugel (1847), Buhse (1864), Schweder (1864), Peltz (1866), Dragendorff (1875), Wolff (1879), Vestergren (1903), Bucholtz (1904), Wahl (1904), Ferle (1906), Treboux (1912), Ferle (1914), Zolk (1915), Bucholtz (1916, 1921).

The first data on the occurrence of *Claviceps* in Estonia are to be found in „Blicke in die Kryptogamenwelt der Ostseeprovinzen“ by Dietrich (1856, 1859 p. 345, 519). In this book the occurrence of *Claviceps*, sub *Sclerotium clavus* DC., is recorded on the following hosts — although without any data on habitats:

- | | |
|-------------------------------------|------------------------------------|
| (**) 1. <i>Alopecurus pratensis</i> | (**) 8. <i>Hierochloa borealis</i> |
| 2. <i>Anthoxanthum odoratum</i> | (**) 9. <i>Hordeum</i> sp. |
| (**) 3. <i>Avena pratensis</i> | 10. <i>Lolium perenne</i> |
| (**) 4. <i>Bromus secalinus</i> | 11. <i>Poa compressa</i> |
| (**) 5. <i>Catabrosa aquatica</i> | 12. <i>Secale cereale</i> |
| 6. <i>Dactylis glomerata</i> | 13. <i>Sesleria coerulea</i> . |
| 7. <i>Festuca</i> sp. | |

6 hosts out of these 13 were new to science (marked here with **, but with „mihi“ by Dietrich l. c.). Dietrich carried out his observations in the environments of his residence

Haimre (Heimar) in the district of Läänemaa (in the west of Estonia), and in the environments of Tallinn. Therefore, we can refer the 13 nutritive plants named by him to the habitats mentioned.

Dragendorff (1875) was the first to publish researches on the chemical combination of Ergot.

Vestergren (1903) found *Claviceps microcephala* on *Sesleria coerulea* in the island of Saaremaa (Ösel).

Treboux (1912) counts the following species of *Claviceps* in the environs of the town of Pärnu:

Claviceps microcephala Tul.: *Molinia coerulea* Mch., *Sesleria coerulea* Ard.

Claviceps purpurea Tul.: *Bromus secalinus* L., *Dactylis glomerata* L., *Festuca elatior* L., *Hordeum vulgare* L., *Secale cereale* L., *Triticum repens* L.

Bucholtz (1916) found *Claviceps purpurea* Tul. on the island of Saaremaa on the following species: *Ammophila arenaria*, *Anthoxanthum odoratum*, *Briza media*, *Dactylis glomerata*, *Festuca rubra*.

In a small note Bucholtz names one more habitat of *Claviceps nigricans* Tul. on *Heleocharis palustris* on the left bank of the river Emajõgi (Embach) at Tartu (1921). In the same place I found the fungus plentifully in the summer of 1925.

Käsebier (1926) reports the distribution of *Claviceps purpurea* Tul. in Estonia.

Thus, up to this time there have become known 16 nutritive plants for *Claviceps* in Estonia.

I have been able to carry out my own mycologic observations since the year 1924, in several places in Estonia, but mainly in the environments of Tartu. The proofs of this are in the Herbarium of the Phytopathological Institute of the Tartu University. The number of plants known to nourish *Claviceps*, has thereby considerably increased, and the time seems to be ripe to sum up the observations made to the present time.

In the list below all the discoveries of *Claviceps* that hitherto have been made known in Estonia are summed up according to the sources of literature and herbaries I am acquainted with. Artificial infection experiments have not yet been carried out in Estonia, therefore, a transfer of *Claviceps purpurea* and *Cl. microcephala* from nutritive plant to nutritive plant might be possible.

In the undermentioned list the nutritive plants new to Estonia are marked with one asterisk — *, the hosts new to science are marked with a double asterisk — **. The nutritive plants discovered in Estonia by earlier authors, but new to science are marked with a double asterisk in brackets — (**).

According to this list 5 species of *Claviceps* with 3 biological varieties on 52 nutritive plants are now known in Estonia. Out of these there are 28 nutritive plants new to Estonia, 8 of them new to science.

Claviceps purpurea Tul.

Dietrich 1856, p. 345, 1859, p. 519 sub *Sclerotium Clavus* DC.; Treboux 1912, p. 101; Bucholtz 1916, p. 26; Zolk 1915, p. 266; Käsebier 1926, p. 2.

* 1. *Agropyron caninum* P. Beauv. Tartu, the Vasula wood (Lepik VIII. 1931). A few Sclerotia found only once.

2. *Agropyron repens* P. Beauv. (*Triticum repens* L.) Pärnu (Treboux 1912). Tartu Bucholtz, in Herbarium Instit. Phytopathol. Univ. Tartuensis). I myself have not noticed the fungus on this host.

** 3. *Alopecurus aequalis* Sob. Tartu: Timuvere by Anemõis (Lepik 24. VIII 1925), Vorbuse (Lepik 12. IX 1929), Vasula (Lepik 19. VI 1929). Rather frequently and often in masses.

** 4. *Alopecurus geniculatus* L. Tartu: Meltsitiik (Lepik 19. IX 1924), Kvistental (Lepik 31. X 1934).

5. *Alopecurus pratensis* L. (Dietrich 1859, p. 520; Crypt. Cent. IX, 90). Tartu, Vahi (Lepik 22. VIII 1925). Not often.

6. *Ammophila arenaria* L. k. Saaremaa (Island Ösel, according to Bucholtz 1916).

7. *Anthoxanthum odoratum* L. (Dietrich 1859, p. 519, Crypt. Cent. VII, 45). Saaremaa (Bucholtz 1916).

* 8. *Arrhenatherum elatius* M. et K. Saaremaa, Vilsandi (Lepik 2. VII 1924). Tartu, Raadi (Lepik 27. VIII 1924). Often in masses. Tartu, Kvistental (Lepik 21. X 1934).

(**) 9. *Avena pratensis* L. (Dietrich 1859, p. 520). Rare.

10. *Briza media* L. Saaremaa (Bucholtz 1916). Not often.

* 11. *Bromus inermis* Leyss. Tartu, Raadi (Lepik 5. VIII 1931). A few Sclerotia found only once.

* 12. *Bromus mollis* L. Saaremaa, Harilaid (Lepik 3. VII 1931).

13. *Bromus secalinus* L. (Dietrich 1856, p. 345, Crypt. Cent. III, 21). Pärnu (Treboux 1912). Tartumaa, Sangaste (Lepik 18. VII 1925). Rather widely spread.

* 14. *Calamagrostis arundinacea* Roth. Saaremaa: Sõrve (Bucholtz 18. VIII 1908 in Herb. Inst. Phytopathol. Tartu). Tartu, Mudaniku (Lepik 11. V III 1925, 12. IX 1929). Kastre-Peravalla

(Lepik, 18. VIII 1931). Tartu, in the Vasula wood (Lepik 31. X 1934). Rather commonly distributed.

** 15. *Calamagrostis epigeios* Roth. Tartu, Vahi, Vasula (Lepik 31. X 1934).

* 16. *Calamagrostis neglecta* P. Beauv. Tartu, Vasula (Lepik 5. IX 1932).

(**) 17. *Catabrosa aquatica* P. Beauv. (Dietrich 1859, p. 520, Crypt. Cent. IX, 91). Tartu, Meltsitiik (Lepik 19. IX 1924). Rare.

18. *Dactylis glomerata* L. Haimre (Dietrich 1856, p. 345, Crypt. Cent. II, 74). Pärnu (Trebourg 1912). Saaremaa (Bucholtz 1916). Tartu, Vahi, Vasula, Raadi (Lepik 31. X 1934). Common.

* 19. *Festuca arundinacea* Schreb. Tartu, Kvistental (Lepik 16. IX 1934; 31. X 1934). Sporadically.

** 20. *Festuca gigantea* Vill. Tartu, the Vasula wood (Lepik 19. VIII 1925), the Ropka wood (Lepik, 18. X 1925), the Vorbuse wood (Lepik, 16. VIII 1931). Rather widely spread, especially in the woods.

* 21. *Festuca ovina* L. Saaremaa, Nasva (Lepik 8. VII 1930). Rare.

22. *Festuca pratensis* Huds. Pärnu (Trebourg 1912). Tartu (Bucholtz 14. IX 1920 in collect. Instituti Phytopathol. Univ. Tartuensis). Tartu, Raadi (Lepik 23. IX 1925, 28. X 1934). Common.

(**) 23. *Festuca rubra* L. Saaremaa (Bucholtz 1916). Rare.

(**) 24. *Hierochloa odorata* (L.) Wahlenb. (*H. borealis* R. et Schreb.). (Dietrich 1859, p. 519, Crypt. Cent. VII, 46). Rare.

* 25. *Hordeum distichum* L. cult. Tartu, Raadi (Lepik 5. VIII 1925) Not common.

26. *Hordeum vulgare* L. cult. (Dietrich 1856, p. 345, Crypt. Cent. III, 20). Pärnu (Trebourg 1912). Tartu (Lepik 5. VIII 1925). Not common; usually only a few ears of barley are infected.

* 27. *Phalaris arundinacea* L. Saaremaa, Tiirimetsa (Lepik 8. VII 1931).

* 28. *Phleum pratense* L. Tartu, Raadi (Lepik 23. IX 1925), Vorbuse (Lepik 16. VIII 1931). Kastre-Peravalla, the University experimental and research forest (Lepik 18. VIII 1931). The Ergot is often on timothy-grass and in some years occurs in masses.

29. *Poa compressa* L. (Dietrich 1856, p. 345). Not common.

* 30. *Poa palustris* L. District of Tartu: Kastre-Peravalla (Lepik 18. VIII 1931). Rare.

* 31. *Poa pratensis* L. Tartu, Raadi (Lepik 23. IX 1925). Not common.

* 32. *Poa trivialis* L. District of Tartu: Kastre-Peravalla, the University experimental and research forest (Lepik 18. VIII 1931). Rare.

** 33. *Puccinellia distans* Parl. (*Atropis distans* Griseb.). Tartu, on the bank of the river Emajõgi by the swimming baths in brackish water (Lepik 31. X 1934).

34. *Secale cereale* L. cult. (Dietrich 1856, p. 345, Crypt. Cent. III, 19). Pärnu (Treboux 1912). Tartu: Vahi (leg. ? 23. VII 1916 in Herbar d. Instit. Phytopathol. Univ. Tartuensis). Tartu: Raadi (Lepik 30. VII 1935, Zimmermann 14. VII 1931). Common everywhere on the ears of rye, but usually not in masses. Cp. also Käsebier (1926, p. 2).

** 35. *Secale cereale* L. var. *aestivum* cult. Tartu, in the Botanical Gardens (Lepik 19. IX 1925), Raadi (A. Entson, VIII 1934).

* 36. *Secale montanum* Guss. cult. Tartu, in the Botanical Gardens (Lepik 19. IX 1925).

** 37. *Stipa capillata* L. Tartu, in the Botanical Gardens (Lepik 9. IX 1925). A few *Sclerotia* found only once. That *Claviceps purpurea* is here in question follows from the fact that, in the vicinity, *Secale cereale* and *Secale montanum* are badly infected with the fungus; *Claviceps microcephala*, on the contrary, was entirely absent in the neighbourhood. In the following years the fungus was not found any more.

* 38. *Triticum vulgare* Vill. cult. District of Tartu: Arumõis (Lepik 11. VIII 1931), the Luunja estate (Lepik 11. VIII 1931), Tähtvere (18. VIII 1931). The ears of wheat are only very seldom infected with *Claviceps*.

***Claviceps purpurea* Tul. spec. biol. *milii* Stäger.**

* 39. *Brachypodium pinnatum* P. Beauv. Tartu, in the Luunja wood (Lepik 30. VII 1925).

* 40. *Milium effusum* L. District of Tartu, Kastre-Peravalla, in the experimental and research forest of the University (Lepik 18. VIII 1931). Rather widely spread.

***Claviceps purpurea* Tul. spec. biol. *lolii* Stäger.**

41. *Lolium perenne* L. (Dietrich 1856, p. 345, Crypt. Cent. IV, 62).

** 42. *Lolium remotum* Schrank. Tartu, Raadi (Lepik 1926). On this occasion the parasite occurs in masses; otherwise seldom.

***Claviceps microcephala* Tul.**

Treboux 1912, p. 101.

** 43. *Cinna latifolia* (Trev.) Griseb. District of Tartu, Kastre-Peravalla, the University forest, Quart. 129. Once appeared in masses (Lepik 18. VIII 1931). It is probable that the infection spread from *Molinia* growing near by or from *Phragmites*.

* 44. *Deschampsia caespitosa* P. Beauv. Tartu: Mudaniku (Lepik 11. VIII 1925). Kastre-Peravalla, the University forest, Quart. 106 (Lepik 18. VII 1931). Not often.

45. *Molinia coerulea* (L.) M. n. ch. Pärnu (Treboux 1912). Tartu: Tähtvere (Bucholtz 1920, in Herb. d. Inst. Phytopathol.

Univ. Tartu); Vorbuse (Lepik 16. IX 1925, 12. IX 1929), Kvisental (Lepik 31. X 1934). Jõgeva: Väljaotsa "Metsamägi" (Lepik 21. IX 1924); is rather spread widely and occurs frequently in masses

* 46. *Phragmites communis* Trin. District of Tartu, Kastre-Peravalla, the University forest (Lepik 18. VIII 1931). Tartu, by the Vasula lake (Lepik 31. X 1934).

***Claviceps microcephala* Tul. spec. biol. *poae* Stäger.**

On the basis of many infection experiments Stäger (1908, 1910) regards *Claviceps* on *Poa annua* as a peculiar biological form of *Cl. microcephala*. It does not infect *Hordeum*, *Arrhenatherum*, *Lolium*, *Bromus*, *Glyceria*, *Deschampsia* and species of *Poa*. *Claviceps* of rye is said not to pass to *Poa annua*.

* 47. *Poa annua* L. Tartu, Raadi (Lepik 28. X 1934), Kvisental on the bank of the river Emajõgi (Lepik 31. X 1934). Often.

***Claviceps sesleriae* Stäger.**

Dietrich 1856, p. 345, Cent. VI, 69, sub. *Sclerotium clavus* DC. Vestergren 1903, p. 110, Treboux 1912, p. 101. Stäger (1907) has proved by infection experiments that *Claviceps* of *Sesleria coerulea* does not pass to other grasses and has described it as an independent species.

48. *Sesleria coerulea* Ard. (Dietrich 1856, p. 345, Crypt. Cent. VI, 69). Saaremaa (Vestergren 1903); Kuusnõmme (Lepik 2. VII 1931); Kuresaare, Loodemets (Lepik 20. VI 1934. Pärnu (Treboux 1912). District of Tartu: Jõgeva, Väljaotsa (Lepik 24. VI 1925). Läänemaa: the Vihterpalu estate (Th. Nenjukov 8. VII 1932). Rather often and frequently in masses.

***Claviceps Wilsoni* Cooke.**

* 49. *Glyceria fluitans* R. Br. Tartu: Raadi (Lepik 17. VIII 1927, 28. X 1934), in the Vorbuse wood (Lepik 12. IX 1925), Mount Vapra (Lepik 7. IX 1931). Tapa (A. Luhakooder 15. VIII 1929).

* 50. *Glyceria plicata*. Fr. Viljandi, on the shore of the lake (Lepik 11. VII 1913).

* 51. *Glyceria remota* Fr. District of Tartu, Kastre-Peravalla, the forest of the University, Quart. Nr. 106 (Lepik 18. VIII 1931).

***Claviceps nigricans* Tul.**

Bucholtz 1921, p. 10.

52. *Heleocharis palustris* R. Br. Tartu: Kvisental (Bucholtz 1921, Lepik 22. VIII 1925). The Ergot is seldom found on the species of *Heleocharis*. In the above mentioned habitats the fungus occurred, however, many years in succession, showing that the nutritive plant was rather badly infected,

List of Nutritive Plants for Claviceps found in Estonia.

Hosts, alphabetically arranged	No.	according to				
		Dietrich	Vestergren	Treboux	Bucholtz	Lepik
* ¹⁾ <i>Agropyrum caninum</i> P. B.	1	—	—	—	—	+
— <i>repens</i> P. B.	2	—	—	+	+	—
** <i>Alopecurus aequalis</i> Sob.	3	—	—	—	—	+
** — <i>geniculatus</i> L.	4	—	—	—	—	+
— <i>pratensis</i> L.	5	+	—	—	—	+
<i>Ammophila arenaria</i> Lk.	6	—	—	—	+	—
<i>Anthoxanthum odoratum</i> L.	7	+	—	—	+	—
* <i>Arrhenatherum elatius</i> M. et K.	8	—	—	—	—	+
(**) <i>Avena pratensis</i> L.	9	+	—	—	—	—
* <i>Brachypodium pinnatum</i> P. B.	39	—	—	—	—	+
<i>Briza media</i> L.	10	—	—	—	+	—
* <i>Bromus inermis</i> Leyss.	11	—	—	—	—	+
* — <i>mollis</i> L.	12	—	—	—	—	+
— <i>secalinus</i> L.	13	+	—	+	—	+
* <i>Calamagrostis arundinacea</i> Roth.	14	—	—	—	+	+
** — <i>epigeios</i> Roth.	15	—	—	—	—	+
* — <i>neglecta</i> P. B.	16	—	—	—	—	+
(**) <i>Catabrosa aquatica</i> P. B.	17	+	—	—	—	+
** <i>Cinna latifolia</i> (Trev.) Grieseb.	43	—	—	—	—	+
<i>Dactylis glomerata</i> L.	18	+	—	+	+	+
* <i>Deschampsia caespitosa</i> P. B.	44	—	—	—	—	+
* <i>Festuca arundinacea</i> Schreb.	19	—	—	—	—	+
** — <i>gigantea</i> Vill.	20	—	—	—	—	+
* — <i>ovina</i> L.	21	—	—	—	—	+
— <i>pratensis</i> Huds.	22	—	—	+	+	—
(**) — <i>rubra</i> L.	23	—	—	—	—	—
* <i>Glyceria fluitans</i> R. Br.	49	—	—	—	—	+
* — <i>plicata</i> Fr.	50	—	—	—	—	+
* — <i>remota</i> Fr.	51	—	—	—	—	+
<i>Heleocharis palustris</i> R. Br.	52	—	—	—	+	+
(**) <i>Hierochloa odorata</i> (L.) W a h l.	24	+	—	—	—	—
* <i>Hordeum distichum</i> L.	25	—	—	—	—	+
— <i>vulgare</i> L. cult.	26	+	—	+	—	+
<i>Lolium perenne</i> L.	41	+	—	—	—	—
** — <i>remotum</i> Schrank	42	—	—	—	—	+

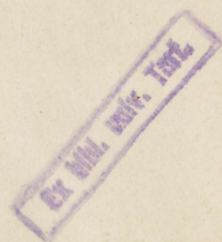
¹⁾ The nutritive plants new to Estonia are marked with one asterisk — *, the hosts new to science are marked with a double asterisk — **. The nutritive plants discovered in Estonia by earlier authors, but new to science are marked with a double asterisk in brackets (**).

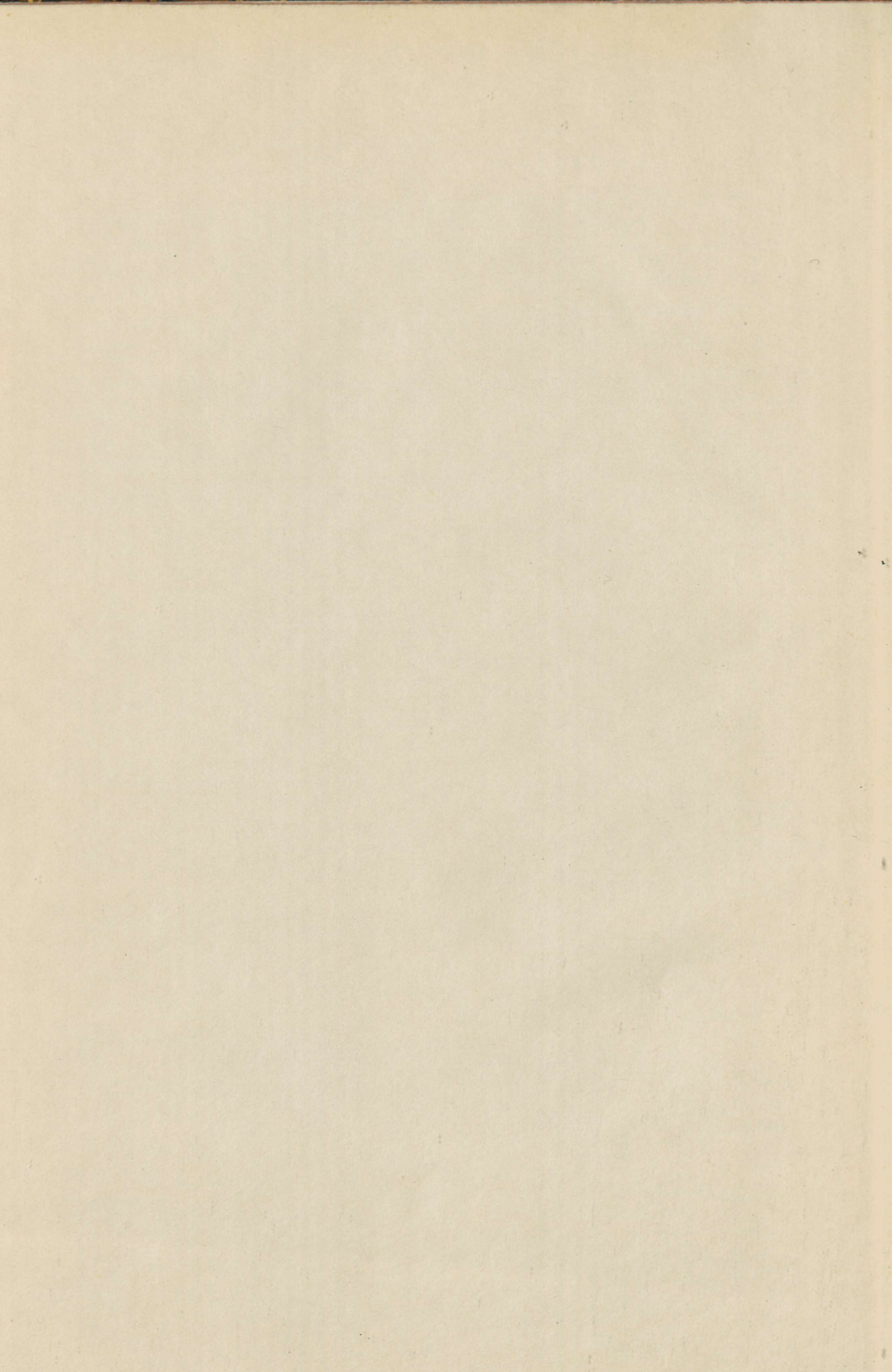
Hosts, alphabetically arranged	No.	according to				
		Diet- rich	Vester- gren	Tre- boux	Buch- oltz	Lepik
* <i>Milium effusum</i> L.	40	—	—	—	—	+
<i>Molinia coerulea</i> (L.) Mnch.	45	—	—	+	+	+
* <i>Phalaris arundinacea</i> L.	27	—	—	—	—	+
* <i>Phleum pratense</i> L.	28	—	—	—	—	+
* <i>Phragmites communis</i> Frick.	46	—	—	—	—	+
* <i>Poa annua</i> L.	47	—	—	—	—	+
— <i>compressa</i> L.	29	+	—	—	—	—
* — <i>palustris</i> L.	30	—	—	—	—	+
* — <i>pratensis</i> L.	31	—	—	—	—	+
* — <i>trivialis</i> L.	32	—	—	—	—	+
** <i>Puccinellia distans</i> Parl. . .	33	—	—	—	—	+
<i>Secale cereale</i> L. <i>cult.</i>	34	+	—	+	—	+
** — — <i>var. aestivum cult.</i>	35	—	—	—	—	+
* — <i>montanum</i> Guss. <i>cult.</i>	36	—	—	—	—	+
<i>Sesleria coerulea</i> Ard.	48	+	+	+	—	+
** <i>Stipa capillata</i> L.	37	—	—	—	—	+
* <i>Triticum vulgare</i> Vill.	38	—	—	—	—	+

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