Insect fauna of selected polypore fungi on birch stems in northern Bohemia

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Kula, E., Boháč, J., Jelínek, J., 1999. Insect fauna of selected polypore fungi on birch stems in northern Bohemia. *Misc. Zool.*, 22.1: 75-85.

Insect fauna of selected polypore fungi on birch stems in northern Bohemia.– Fauna of polypore fungi *Fomes fomentarius* (L. x Fries) Kicks, *Piptoporus betulinus* (Bull. ex Fr.) F. Karsten, *Fomitopsis pinicola* (Swatr ex Fr.) P. Karsten of the birch stem, consisted of 55 insect species. The following species were dominant: *Diaperis boleti* F. 34.8%, *Aridius nodifer* West. 19.9%, *Bolitophagus reticulatus* L. 10.9%, *Epuraea variegata* (Herbst.) 6.3%, *Gyrophaena boleti* (L.) 5%, *Cis jacquemarti* Mellié 4.9%, *Atheta fungi* (Gras) 3.5%, *Atheta crassicornis* (F.) 2.8% and moth *Archinemapogon yildizae* Kocak 2.1%. *A. nodifer* (Latridiidae) is a ubiquitous mycetophagous species which in our conditions prefers *P. pinicola* and has a significant position in the fauna of *P. betulinus*. Thunes (1994) reports *C. jacquermarti* only from pine forest, where it formed 54.6% on sporocarps of *F. fomentarius* while only 1.3% on *P. betulinus*. In our collections made in birch stands it preferred multiyear sporocarps of *F. pinicola* and *F. fomentarius* to *P. betulinus*. In the Czech Republic it is generally common in deciduous forests especially on *F. fomentarius*, often simultaneously with *C. alter*. This can lead to the conclusion that it is the sporocarp of decaying fungus species which is decisive rather than the type of forest (Paviour-Smith 1960, Lawrence 1973, Jelínek 1990). Dominant representation of *D. boleti* species (34.8%) has been registered with an evident linkage to *P. betulinus* (50.6%) and *F. fomentarius* (31.1%) and *B. reticulatus* with prevailing bond to *F. fomentarius* (46.3%). Butterfly caterpillar fauna showed a limited species spectrum, yet its representatives occurred in all sporocarps, *P. betulinus* being generally preferred.

Key words: Birch, *Betula verrucosa*, *Fomes fomentarius*, *Piptoporus betulinus*, *Fomitopsis pinicola*, Insect fauna.

(Rebut: 5 V 98; Acceptació condicional: 26 X 98; Acc. definitiva: 30 IV 99)

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ISSN: 0211-6529

Introduction

Sporocarps of polypore fungi form a special niche colonised initially by beetles and moth representatives. The majority of species contribute to the sporocarp decomposition but at the same time a vast spectrum of predator species of Staphylinidae occurs there. The composition of invertebrate fauna is influenced by the species of fungus, particularly by its consistence, water content and duration of living sporocarp. *Piptoporus betulinus* (Bull. ex Fr.) P. Karsten dies within one year after spore loosing, whereas *Fomes fomentarius* (L. ex Fries) Kicks has sporocarps living several years (2.5 years). *F. fomentarius* attacks not only birch but also oak, alder, willow, beech and conifers (Černý 1976). *Fomitopsis pinicola* (Swatr ex Fr.) P. Karsten has sporocaps living longer, up to 3-5 years.

Several authors investigated fungal fauna: Thunes (1994), Thunes & Willassen (1997), Klimaszewski & Peck (1987), Matthewman & Pielou (1971), Pielou & Verma (1968), Paviour-Smith (1960, 1965), Will (1995), Nadvornaya & Nadvornyj (1991), Kaila et al. 1994, Jonsell & Nordlander (1995). The prospected area covers localities of the north-east of Europe and Canada.

The aim of this paper is to enlarge the geographical framework by means of the determination of insect fauna and phenology of dominant species developing in sporocarps of polypore fungi growing on stems of birch trees in a region of the Czech Republic affected by a permanent air contamination.

Material and methods

Sporocarps of *P. betulinus, F. fomentarius* and *F. pinicola* of unspecified ages were collected in March only from standing birch stems in the age class III (40-60 years) with reduced stand density situated in the forest district Sněžník (northern Bohemia) (fig. 1), at an altitude of 550-600 m. The Sněžník sandstone highland links up with the eastern rim of the Krušné hory mountains and is characterised by an undulating upland plateau of 550-720 m altitude, average annual temperatures of 6-7°C and total annual precipitation of 800 mm. Long-term average annual SO_2 load (1969-1987) reached 62 $\mu g.m^{-3}$. The average load of SO_2 and NO_x in the growing season was 29 $\mu g.m^{-3}$ and 19 $\mu g.m^{-3}$, respectively (Tůma, 1988).

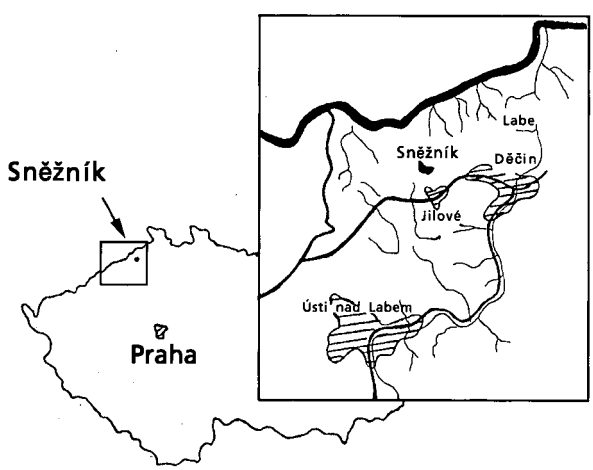


Fig. 1. Study area.
Área de estudio.

Table 1. Entomofauna of sporocarps of *F. pinicola* (H1), *F. fomentarius* (H2) and *P. betulinus* (H3) growing on birch stems (Sněžník-N Bohemia): PV. Food chain; OBM. Obligatory mycophagous species of polypore fungi; OBJ. Obligatory mycophagous species on other fungi; K. Carnivorous species; FO. Accidentally occurring species; FA. Facultative species; P. Parasitoids.

Entomofauna de los esporocarpos de F. pinicola *(H1),* F. fomentarius *(H2) y* P. betulinus *(H3) que crecen en tallos de abedul (Sněžník-N Bohemia): PV. Cadena trófica; OBM. Especies micófagas obligatorias de los hongos políporos; OBJ. Especies micófagas obligatorias de otros hongos. K. Especies carnívoras; FO. Especies accidentales; FA. Especies facultativas; P. Parasitoides.*

	PV	H1	%	H2	%	H3	%	□∑	%
Coleoptera species									
Aleochara sparsa Heer	FA	0	0.0	3	0.3	2	0.1	5	0.0
Anaspis sp.	OBJ	1	0.1	0	0.0	1	0.0	2	0.0
Anisotoma humeralis (F.)	OBJ	1	0.1	1	0.1	0	0.0	2	0.0
Aridius nodifer (Westwood)	OBM	511	43.4	31	2.6	474	17.4	1,016	19.9
Atheta aterrima (Grav.)	FA	0	0.0	1	0.1	0	0.0	1	0.0
Atheta crassicornis (F.)	FA	29	2.5	14	1.2	98	3.6	141	2.8
Atheta fungi (Grav.)	FA	38	3.2	38	3.2	104	3.8	180	3.5
Atheta gagatina (Bauch.)	OBJ	2	0.2	3	0.3	23	0.8	28	0.5
Atheta oblita (Er.)	OBM	0	0.0	0	0.0	2	0.1	2	0.0
Atheta picipennis (Mannh.)	FA	1	0.1	2	0.2	1	0.0	4	0.1
Atheta ravilla (Er.)	FA	0	0.0	0	0.0	1	0.0	1	0.0
Atheta sodalis (Er.)	FA	0	0.0	0	0.0	4	0.1	4	0.1
Atheta subtilis (W. Scriba)	FO	17	1.4	3	0.3	15	0.6	35	0.7
Atheta triangulum (Kv.)	FA	0	0.0	0	0.0	1	0.0	1	0.0
Atomaria sp.		4	0.3	2	0.2	10	0.4	16	0.3
Bitoma crenata (F.)	OBM	0	0.0	0	0.0	4	0.1	4	0.1
Bolitochara obliqua (Er.)	OBM	0	0.0	0	0.0	2	0.1	2	0.0
Bolitophagus reticulatus (L.)	OBM	0	0.0	551	46.3	5	0.2	556	10.9
Cantharis nigricans (Müller)	FO	1	0.1	0	0.0	0	0.0	1	0.0
Cantharis pellucida F.	FO	0	0.0	0	0.0	1	0.0	1	0.0
Cis glabratus Mellié	OBM	8	0.7	4	0.3	2	0.1	14	0.3
Cis jacquemarti Mellié	OBM	171	14.5	66	5.5	13	0.5	250	4.9
Cis alter Silfverberg	OBM	6	0.5	12	1.0	2	0.1	20	0.4
Corticaria sp.		3	0.3	1	0.1	1	0.0	5	0.0
Cryptophagus sp.		0	0.0	1	0.1	4	0.1	5	0.0
Dacne bipustulata (Thunberg)	OBM	0	0.0	0	0.0	1	0.0	1	0.0
Diaperis boleti (L.)	OBM	26	2.2	370	31.1	1377	50.6	1773	34.8

Tabla 1. (cont.)

	PV	H1	%	H2	%	H3	%	∑	%
Dienerella elongata (Curtis)		2	0.2	0	0.0	1	0.0	3	0.1
Epuraea unicolor (Ol.)		1	0.1	0	0.0	2	0.1	3	0.1
Epuraea variegata (Herbst)	OBM	62	5.3	25	2.1	235	8.6	322	6.3
Gyrophaena boleti (L.)	OBM	223	18.9	9	0.8	22	0.8	254	5.0
Gyrophaena joyi Wend.	OBM	0	0.0	1	0.1	0	0.0	1	0.0
Leptusa pulchella (Mannh.)	FA	0	0.0	3	0.3	3	0.1	6	0.1
Lygistopterus sanguineus (L.)		0	0.0	0	0.0	1	0.0	1	0.0
Melanimon tibiale (F.)	FO	0	0.0	0	0.0	1	0.0	1	0.0
Monotoma longicollis (Gyll.)		0	0.0	1	0.1	0	0.0	1	0.0
Omonadus floralis (L.)	FO	0	0.0	1	0.1	0	0.0	1	0.0
Oxypoda abdominalis (Mannh.)	FA	1	0.1	0	0.0	0	0.0	1	0.0
Oxytelus rugosus (F.)	FA	1	0.1	2	0.2	1	0.0	4	0.1
Oxytelus tetracarinatus (Block.)	FA	1	0.1	0	0.0	0	0.0	1	0.0
Philonthus longicornis Steph.	FO	0	0.0	0	0.0	1	0.0	1	0.0
Phloeostiba plana (Payk.)	FA	0	0.0	0	0.0	1	0.0	1	0.0
Phloeonomus punctipenis (C.G.Th.)	FA	2	0.2	0	0.0	3	0.1	5	0.0
Rhizophagus bipustulatus (F.)	(K)	1	0.1	5	0.4	13	0.5	19	0.4
Rhizophagus dispar (Paykull)	(K)	0	0.0	1	0.1	34	1.2	35	0.7
Rhopalodontus perforatus (Gyll.)	OBM	2	0.2	0	0.0	0	0.0	2	0.0
Salpingus planirostris (F.)	K	1	0.1	0	0.0	0	0.0	1	0.0
Scaphosoma sp.	OBJ	3	0.3	0	0.0	1	0.0	4	0.1
Sepedophilus littoreus (L.)	FA	11	0.9	3	0.3	20	0.7	34	0.7
Sepedophilus testaceum (F.)	FA	12	1.0	2	0.2	44	1.6	58	1.1
Tachyporus hypnorum (F.)	FO	1	0.1	0	0.0	0	0.0	1	0.0
Tetratoma fungorum F.	OBJ	0	0.0	0	0.0	1	0.0	1	0.0
Trichophya pilicornis (Gyll.)	FA	0	0.0	0	0.0	3	0.1	3	0.1
Trixagus carinifrons (Bonv.)		10	0.8	6	0.5	3	0.1	19	0.4
Lepidoptera species									
Archinemapogon yildizae Kocak		12	1.0	20	1.7	76	2.8	108	2.1
Argyresthia goedartella L.		8	0.7	1	0.1	52	1.9	61	1.2
Eriocrania sp.	FO	0	0.0	0	0.0	1	0.0	1	0.0
Nematopogon sp.		2	0.2	6	0.5	33	1.2	41	0.8
Scardia tessulatella Lienig et Zeller		3	0.3	1	0.1	24	0.9	28	0.5
Total		1,178	100	1,191	100	2,724	100	5,093	100

Tabla 1. (Cont.)

	PV	H1	H2	H3	Σ	%
Hymenoptera species						
Braconidae						
Choeras parasitelae Bché.	P	5	6	36	47	50
Glabrobracon sp.	P	1			1	1.1
Macrocentrus kurnakovi Tob.	P	2	2	14	18	19.1
Orthostigma sp.	P	2			2	2.1
Gasteruptiidae						
Gasteruption assectator L.	P			1	1	1.1
Ichneumonidae						
Aperileptus sp.	P			6	6	6.4
Hemiteles sp.	P	1			1	1.1
Lissonota buccator Thunb.	P	8	1	4	13	13.8
Nemeritis sp.	P	4			4	4.2
Phaeogenes sp.				1	1	1.1
Total		23	9	62	94	100

The investigated sporocarps were separated according to species and placed on tar cardboard (to prevent penetration of insects from soil) and covered with photoeclectors (1 x 1 x 0.3 m). Photoeclectors were covered with soil material on their periphery so that the insects originating from sporocarps could leave the restricted area only through the opening on the photoeclector side, equipped with collecting vial with 75% ethylalcohol. Samples were collected in one week intervals from mid-April to mid-October in 1990-1991.

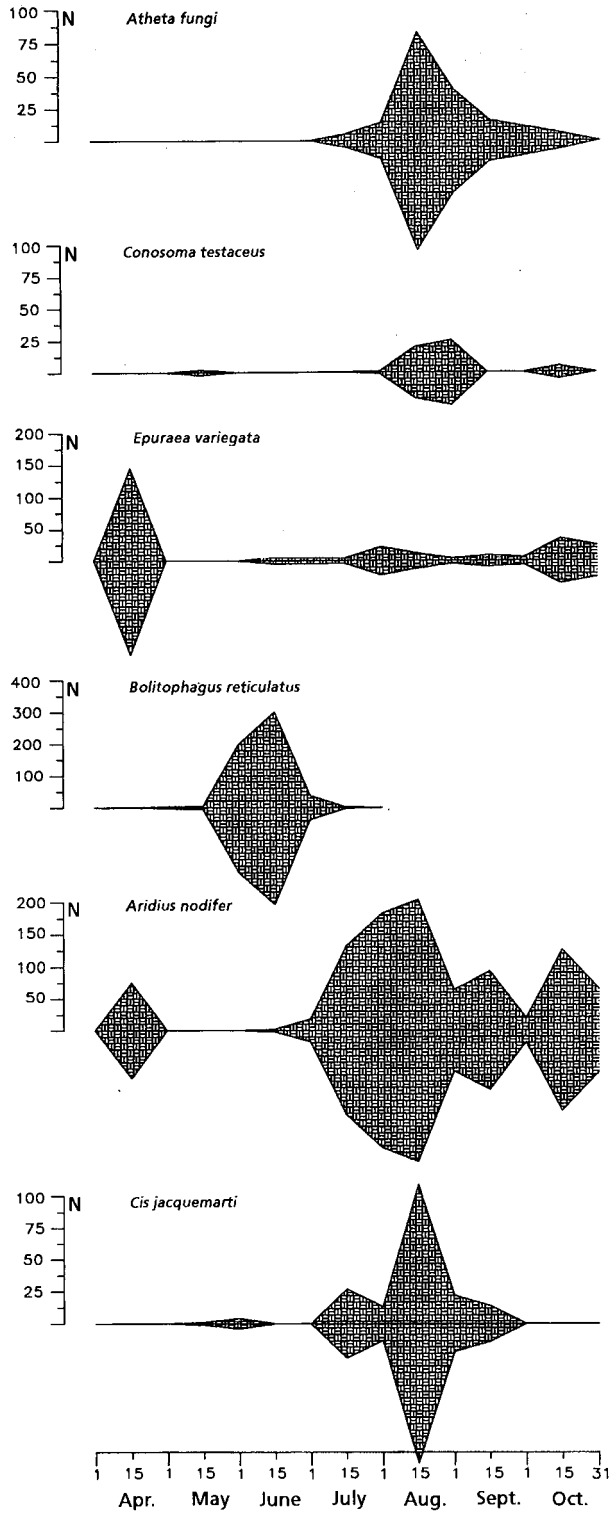
Results

A total of 5,093 specimens of 55 insect species were collected (table 1) from stored sporocarps of three species of polypore fungi, of which 239 specimens belonged to Lepidoptera, and the others to Coleoptera. Dominant species were: *Diaperis boleti* F., *Aridius nodifer* West., *Bolitophagus reticulatus* L., *Epuraea variegata* (Herbst.), and *Gyrophaena boleti* (L.). Subdominant species were *Cis jacquemarti* Mellié, *Atheta fungi* (Gras), *Atheta crassicornis* (F.) and moth *Archinemapogon yildizae* Kocak (table 1).

Of the 32 species collected from *F. pinicola,* four were dominant (*A. nodifer, G. boleti, C. jacquemarti* and *E. variegata*). Significant secondary species of this fungus were represented by *A. fungi, A. crassicornis, D. boleti* (table 1).

Of the 32 species listed from *F. fomentarius,* three were dominant: *B. reticulatus, D. boleti* and *C. jaquemarti* and three subdominant: *A. nodifer, A. fungi* and *E. variegata* (table 1).

Sporocarps of *P. betulinus* yielded the highest species richness (42) with three dominant *D. boleti, A. nodifer* and *E. variegata* and some subdominant rove beetles *A. fungi, A. crassicornis* and butterflies *A. yildizae* and *Argyresthia goedartella* L. (table 1). Several parasitoids were recorded simultaneously with the fauna of butterflies and beetles. In braconids the dominant species were


100
75
50
25
N
Atheta fungi
100
75
50
25
N
Conosoma testaceus
200
150
100
50
N
Epuraea variegata
400
300
200
100
N
Bolitophagus reticulatus
200
150
100
50
N
Aridius nodifer
100
75
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Cis jacquemarti
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Apr. May June July Aug. Sept. Oct.

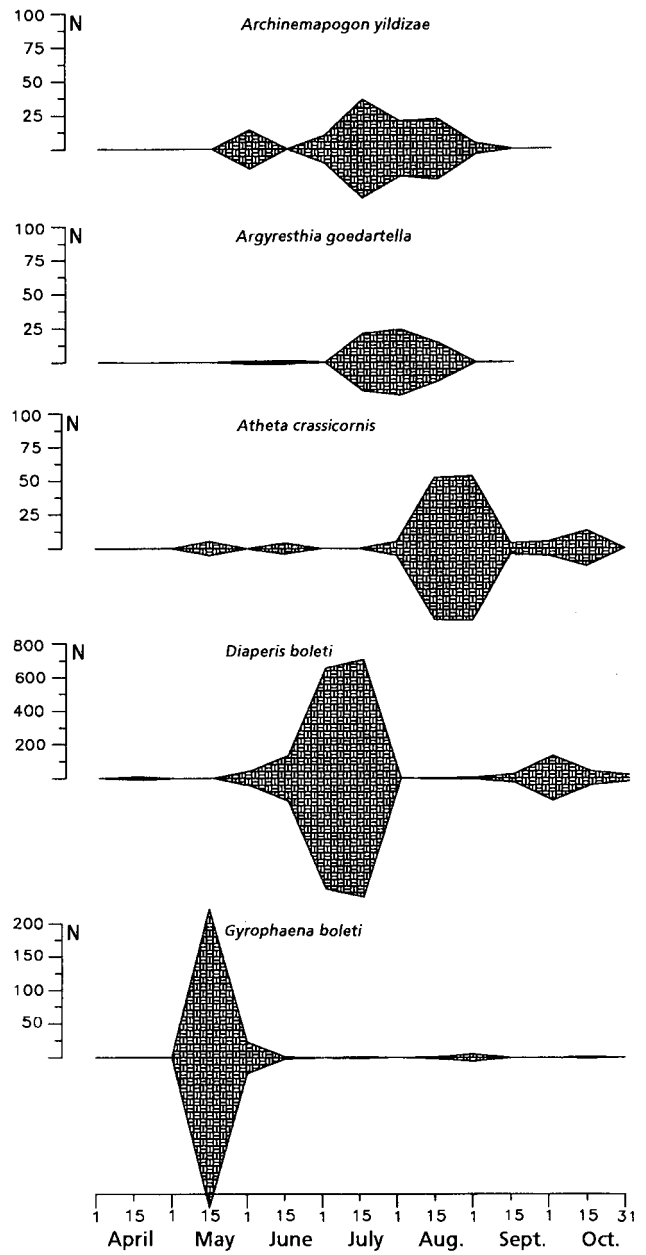

Fig. 2. Seasonal dynamics of the most numerous species of the fauna of polypore fungi sporocarps growing on birch stems (N Bohemia, 1990).

Dinámica estacional de las especies más numerosas de esporocarpos de hongos políporos que crecen en tallos de abedul (N Bohemia, 1990).

Choeras parasitellae Bché. (20 males, 27 females) and *Macrocentrus kurnakovi* Tob. (seven males and 11 females), which develop in larvae of *Tineidae.* The remaining species occurred in one or two specimens of *Gasteruption assectator* L. (attacks species of *Sphecidae*), *Glabrobracon* sp., *Dacnusa* sp., *Orthostigma* sp.

In ichneumonids only *Lissonota buccator* Thunb. (six males, seven females) was determined to species and the rest to genera *Phaeogenes* sp., *Aperileptus* sp., *Hemiteles* sp., *Nemeritis* sp.

Occurrence phenology of the most significant fauna species of polypore fungi sporocarps (fig. 2) suggested differences between hibernating or hatching imagoes in their sporocarps leaving activity.

E. variegata initially displayed activity with the hibernating part of the population, which under the photoeclector conditions developed so that imagoes appeared in summer and autumn, and in 1991 the next generation of imagoes was leaving the original sporocarps material in May.

All individuals of *G. boleti* hibernating in sporocarps left them in May, and no development followed in the next year.

B. reticulatus completed its development within June when leaving sporocarps and no next generation was found in original sporocarps.

D. boleti, whose imagoes left the place of development between the beginning of June and mid-July, appears in new generation in autumn (IX-X) with culmination in the second half of September.

C. jacquemarti started to appear as of mid-July with a marked culmination in mid-August. It founded a new generation in the original sporocarps and in 1991 it culminated identically in mid-August at the same abundance level.

A few *A. nodifer* appeared as early as April and founded a probably successful generation, which started hatching in July. Its abundance remained high till the end of August. Imagoes were active till the end of the growth season and hibernated in sporocarps.

Sepedophilus littoreus (F.), which occurred in original sporocarps only in restricted number, significantly increased its representation the following year.

Discussion

The ecological qualities of different forest types are more important than qualities of the sporophores per se. For *F. fomentarius,* the most explanatory variable was whether the sporocarp was dead or alive, while sporocarp weight was the most explanatory variable for beetles inhabiting *P. betulinus* (Thunes & Willassen, 1997). Various factors contribute to the decomposing process of the sporocarps, and the faunas change considerably during this process. The host specificity of the obligate polypore inhabitants is probably determined by other factors besides the polypore itself, because the faunas change between forests of different productivity classes and with different tree compositions (Thunes, 1994). For example, the water content of sporocarps is an important determinant for colonization and survival of the chironomids (Willassen & Thunes, 1996). The whole spectrum of insects cannot be evaluated because the age of collected sporocarps was not considered. Thunes (1994) has ranked *A. nodifer* and *C. alter,* attacking sporocarps in their fructification development phase, among pioneer insect species.

C. jacquemarti and *Pteryx suturalis* Heer accompany dead sporocarps of *P. betulinus.* In the next period sporocarps of *F. fomentarius* are attacked by representatives of *Leptusa fumida* (Er.), *A. nodifer, R. dispar* whose share gradually grows whereas other species retreat. Living sporocarps of *F. fomentarius* were attacked by fifteen species and with their ageing the number of obligatory species increased and that of facultative species decreased. In the fauna of *P. betulinus* a contrary trend was observed.

The sample of this work contains sporocarps of all categories. Thunes (1994), who studied the fauna of polypore sporocarps in detail, mentioned 53 species and specified *P. suturalis* as a facultative species with linkage to *F. fomentarius.* In the conditions of forest district Sněžník, 55 species were determined but *P. suturalis* was absent. Of course, it cannot be denied that its occurrence depends on factors other than sporocarp species. Matthewman & Pielou (1971) presented the list of 152 species caught on the surface of sporocarps and within sporocarps of *F. fomentarius* growing on dying birches. Pielou

& VERNA (1968) collected 257 species of insect and mite fauna on *P. betulinus* in Canada. PAVIOUR-SMITH (1965) studied bionomy and development conditions of *Tetratoma fungorum* F. in relation to development stage of sporocarp of *P. betulinus*. Only one specimen of this species was caught. Imagoes of *T. fungorum* occur most often in sporocarps of soft wood-destroying fungi (*Pleurotus* spp., *Flammulina velutipes*) in the period from autumn to spring.

Butterfly caterpillar fauna showed a limited species spectrum, yet its representatives occurred in all sporocarps, *P. betulinus* being generally preferred.

A. nodifer occurred more often in *F. pinicola* and *P. betulinus*. Rove beetles *A. crassicornis* and *A. fungi* were recorded as being on the same level in all studied sporocarp species. As to its representation *B. reticulatus* appears as closely tied to sporocarps of *F. fomentarius*, similarly *C. jacquemarti* preferred multiyear sporocarps and on *P. betulinus* it occupied a subrecedent position. *D. boleti* first developed on *P. betulinus* and *F. fomentarius*, and its bionomy was studied by NADVORNAYA & NADVORNYI (1991), CONRAD (1993). *E. variegata* species appeared in all sporocarps but with in a higher proportion in the fauna of *F. pinicola* and *P. betulinus*. A significant preference of *F. pinicola* was manifested by *G. boleti*. Two specimens of *Rhopalodontus perforatus* (Gyll.) were recorded in *F. pinicola*, though this species occurs almost exclusively in sporocarps of *F. fomentarius* (JELÍNEK, 1990).

Regarding the number of species, rove beetles were the most numerous family. Representatives of this family are presented as predators not only of insect development stages (eggs, larvae) but also of mites and springtails. Some species are phytophagous with linkage to fungi. Their highest representation was in sporocarps of *F. pinicola* (28.8%), *P. betulinus* (12.9%); on *F. fomentarius* solely 7.1%.

As to *Leptusa* species mentioned by KOCH (1989) as part of the fauna of polypore fungi sporocarps, we could confirm only a singular incidence of species *L. pulchella* (Mann.) with total dominance of 0.1%. Yet THUNES (1994) collected three species of this genus, which he specified as facultative to sporocarps when *L. pulchella* reached 4.3% with *P. betulinus* and 1.3% with *F. fomentarius* whereas *L. fumida* (Er.) (15.5% x 1.6%) and *L. ruficornis* (Er.) (8.7% x 0.6%). In this collection, the next facultative species *Acrulia inflata* (Gyll.) did not appear on *P. betulinus* (5.6%).

As the results of subsequent investigations demonstrate (BEAVER, 1966; MERLIN et al., 1986), species of *Rhizophagus* sp. with the exception of *R. grandis* are primarily mycophagous and saprophagous, but occasionally they can act as predators. In our spectrum we have recorded only three species with a totally low representation (1.1%); in Norway *R. dispar* (Pay.) (9.9%) primarily occurred on *F. fomentarius*. In our conditions it singularly preferred sporocarps of *P. betulinus* whereas it was almost absent on *F. fomentarius*.

A. nodifer (Latridiidae) is an ubiquitous mycetophagous species abundantly represented in all successive stages of sporocarps of *P. betulinus* (19.6%) and *F. fomentarius* (2%) (THUNES, 1994) whereas in our conditions we have registered three species of this family, *A. nodifer* intensely preferring *P. pinicola* and having a significant position in the fauna of *P. betulinus*. THUNES (1994) noted that *A. nodifer* lived in galleries of *C. alter*.

According to THUNES (1994), the species spectrum of *Ciidae* is different in coniferous and broadleaved stands. He reports *C. jacquermarti* only from pine forest, where it formed 54.6% on sporocarps of *F. fomentarius* while only 1.3% on *P. betulinus*. In our collections in birch stands it preferred older sporocarps of *F. pinicola* and *F. fomentarius* to *P. betulinus*. In the Czech Republic it is generally common in deciduous forests, especially on *F. fomentarius*, often simultaneously with *C. alter*. This finding can lead to conclusions that it is the sporocarp of decaying fungus species which is decisive rather than the type of forest (PAVIOUR-SMITH, 1960; LAWRENCE, 1973; JELÍNEK, 1990). We have not succeeded in catching *C. lineatocribratus* Mellié, which is reported from deciduous forests in Norway (THUNES, 1994). In the Czech Republic, *C. lineatocribatus* occurs as a relict species locally on *F. fomentarius* especially in well preserved natural beech stands. It is remarkable that *C. bidentatus* (Ol.) was absent in the studied samples, though it is a characteristic species of *P. betulinus* sporocarps in the Czech Republic.

THUNES (1994) does not mention repre-

sentatives of Nitidulidae among the polypore fungi fauna while we have classified *Epuraea variegata* as dominant and found it on all sporocarp species.

It is surprising that THUNES (1994) did not ascertain representatives of *Tenebrionidae* of which we have registered dominant representation of *D. boleti* species (34.8%) with an evident linkage to *P. betulinus* (50.6%) and *F. fomentarius* (31.1%) and *B. reticulatus* with prevailing bond to *F. fomentarius* (46.3%).

As to the phenology of Ciidae only species *C. jacquemarti* which, according to THUNES (1994), is a spring species, can be compared whereas in our conditions it repeatedly confirmed the summer aspect of occurrence.

Resumen

Fauna de insectos de los hongos políporos encontrados en tallos de abedul en el norte de Bohemia

La fauna de los hongos políporos *Fomes fomentarius* (L. x Fries) Kicks, *Piptoporus betulinus* (Bull. ex Fr.) F. Karsten, *Fomitopsis pinicola* (Swatr ex Fr.) P. Karsten de las ramas de abedul consiste en 55 especies de insectos. Las especies dominantes son: *Diaperis boleti* F. 34,8%, *Aridius nodifer* West. 19,9%, *Bolitophagus reticulatus* L. 10,9%, *Epuraea variegata* (Herbst.) 6,3%, *Gyrophaena boleti* (L.) 5%, *Cis jacquemarti* Mellié 4,9%, *Atheta fungi* (Gras) 3,5%, *Atheta crassicornis* (F.) 2,8% y la polilla *Archinemapogon yildizae* Kocak 2,1%. *A. nodifer* (Latridiidae) es una especie micetófaga obiquista que en las condiciones de este trabajo prefiere *P. pinicola* y ocupa una posición significativa en la fauna de *P. betulinus*. Thunes (1994) cita a *C. jacquermarti* únicamente en los bosques de pinos en donde constituye el 54,6% en esporocarpos de *F. fomentarius* y sólo el 1,3% en *P. betulinus*. En las colecciones estudiadas de abedules prefirió esporocarpos multianuales de *F. pinicola* y *F. fomentarius* a *P. betulinus*. En la República Checa es generalmente común en bosques de hoja caduca, en especial en *F. fomentarius*, a menudo simultaneamente con *C. alter*. Esto lleva a la conclusión de que lo decisivo es el esporocarpo más que el tipo de bosque (Paviour-Smith, 1960; Lawrence, 1973; Jelínek, 1990). La representación dominante de la especie *D. boleti* (34,8%) se registró con un vínculo evidente con *P. betulinus* (50,6%) y *F. fomentarius* (31,1%) y *B. reticulatus* relacionada principalmente con *F. fomentarius* (46,3%). La fauna de orugas de mariposas mostraba un espectro limitado de especies similar, aunque sus representantes se encontraron en todos los esporocarpos especialmente en *P. betulinus*.

Acknowledgements

This work is a contribution to the Grant Project of the Grant Agency of the Czech Republic, N° 526/98/0537 which was also supported by grants from regional companies, firms and institutions: Okresní and Městský úřad in Děčín, Alusuisse Ltd., Netex Ltd. in Děčín, Obalex Ltd. in Jílové, Komerční banka Ltd., Teplárna Ltd., Setuza Ltd., Pyrus Ltd., SCES Ltd. in Ústí n. L., Čížkovická cementárna Ltd. in Čížkovice, ČEZ Ltd. Elektrárna in Ledvice and Počerady, Severočeské doly Chomutov Ltd. Chomutov, Chemopetrol Ltd. in Litvínov.

The determination of the insect fauna was a participatory work of Dr. J. Boháč (Staphylinidae), Dr. J. Jelínek (other beetles), Dr. J. Patočka (Lepidoptera), Dr. M. Čapek (Braconidae), Dr. J. Šedivý (Ichneumonidae).

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