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KARI LÖYTTYNIEMI, ØYSTEIN AUSTARÅ, BRODER BEJER AND BENGT EHNSTRÖM

INSECT PESTS IN FORESTS OF THE NORDIC COUNTRIES 1972—1976

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Kari Löyttyniemi (Finland), Øystein Austaråå (Norway),
Broder Bejer (Denmark) and Bengt Ehnström (Sweden)

INSECT PESTS IN FORESTS OF THE NORDIC COUNTRIES 1972–1976

Tuhohyönteisten esiintyminen Pohjoismaiden metsissä 1972–1976

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The occurrence of insect pests in the Nordic Countries during the period 1972–76 was characterized in South and Central Sweden and parts of Norway by extensive outbreaks of *Ips typographus*. Among defoliators, *Neodiprion sertifer* particularly caused localized damage. Pine shoot damage caused by *Tomicus* spp. in Scots pine stands and damage caused by *Hylobius abietis* in young coniferous plantations continued to be a constant problem in all the Nordic Countries.

Suurimmat tuhot 5-vuotiskauden (1972–76) aikana aiheutti kirjanpainaja *(Ips typographus)*, joka myrsky- ja lumituhojen sekä kuivuuden seurauksena kuivatti kuusia laajoilla aloilla varsinkin Etelä- ja Keski-Ruotsissa sekä paikoitellen Norjassa. Ruskea mäntypistiäinen *(Neodiprion sertifer)* aiheutti paikallisia neulastuhoja. Ytimennävertäjien *(Tomicus* spp.) kasvaintuhot männiköissä ja tukkimiehentäin *(Hylobius abietis)* tuhot nuorissa havupuiden taimistoissa muodostavat jatkuvan ongelman kaikissa Pohjoismaissa.

Helsinki 1979. Valtion painatuskeskus

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1. INTRODUCTION

The Nordic forest entomologists' research group has previously published two five-year reports on the incidence of forest insect pests, covering the periods 1961–66 and 1967–71 (Christiansen 1969, Ehnström et al. 1974). The prevailing conditions in forestry in the Nordic Countries have also been briefly described in these reports. This paper represents the report for the period 1972–76. Annual reports have been published for Denmark by Bejer-Petersen (1973–77).

In the north, the climate during the first half of the five-year period was warmer and drier than normal. The temperature and rainfall during the rest of the period mainly followed the long term means. In the south, winters were milder and the growing seasons much drier than normal.

2. PROBLEMS OF MAJOR INTEREST

21. Scolytids

After the heavy storm fellings and snow damage at the end of the 1960s, *Ips typographus* L. became an established pest of Norway spruce *(Picea abies)* in the southern parts of Central Sweden and in South-East Norway (Ehnström et al. 1974, Fig. 2). During the period 1972–76, *I. typographus* was the insect causing the most problems in Norway and Sweden, and the areas affected by outbreaks have since expanded (Fig. 1). In Norway, damage reached its peak in 1972 when approximately 200 000 m^3 of spruce trees were killed (Bakke & Austarå 1973). In Sweden about 336 000 m^3 of spruces were killed the same year. In spite of the introduction of control measures, the damage continued, and even in 1976, 150 000 m^3 of spruce trees were killed in Sweden and 40 000 m^3 in Norway. The control measures were complicated by the unusual aspects of the development, behaviour and life cycle of *I. typographus*. Firstly, emergence from the breeding material and movement to the hibernating sites started at the end of July, i.e. 2–2 1/2 months after swarming and attack (Pettersen & Austarå 1975). This gave foresters only a couple of months time to detect and cut infested trees (Austarå 1976). In general, such a period is too short for effective control of *I. typographus* populations. Secondly, the frequent establishment of second broods further complicated the control efforts (Bakke et al. 1977). Thirdly, bivoltinism was recorded in Norway (Austarå et al. 1977).

Aerial surveys of the outbreak areas were undertaken both in Norway and Sweden. On the basis of data obtained in conjunction with the national Swedish forest inventory, the volume killed by *I. typographus* up to 1973 has been estimated by Bengtsson (1975). The economic consequences of the damage have been estimated by Nordanstig (1975).

Damage caused by *Pityogenes chalcographus* L. in the same areas, especially in young spruce stands (Lekander 1972), had generally ceased by 1972. Localized outbreaks were however, reported even in 1975. In South Sweden, *Polygraphus poligraphus* L. was found to be associated with the dying of spruce in 1976. In addition to *Ips typographus, I. duplicatus* Sahlb. also infested spruce in a number of isolated cases. In the southern part of Central Sweden, *I. typographus*

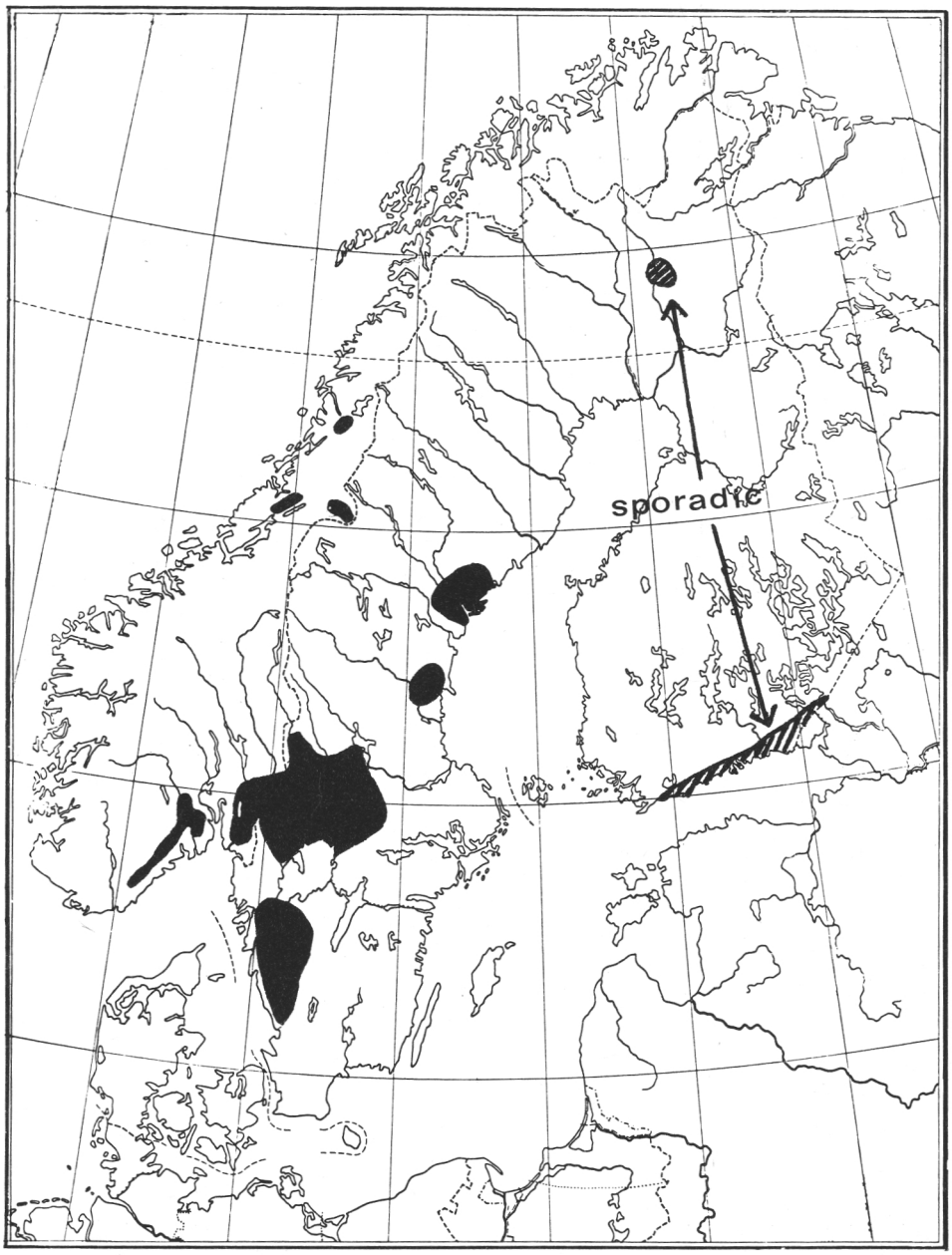

Fig. 1. Outbreak areas of *Ips typographus* during the period 1972–76.

Kuva 1. Kirjanpainajan (Ips typographus) tuhoalueet vuosina 1972–76.

was reported in some instances on *Pinus sylvestris* and in Denmark on *Pinus contorta*.

In Denmark, bark beetle damage occurred in spruce stands in the latter part of the period, probably as a result of extensive drought, with the result that at least 300 000 m^3 of spruce trees were killed (B e j e r - P e t e r s e n 1978).

In south-eastern Finland about 30 000 ha of pine and spruce stands were damaged by storms in summer 1972. Most of the windthrown trees were harvested by the following

summer. However, some suitable breeding material for bark beetles was left in the forests, especially along the state border. As a result, the *Ips typographus* population in the area increased during the warm summer of 1973 and in the years 1974–75 the number of dying spruce trees was greater than normal. About 100 groups of dying trees were reported. However, such outbreaks had ceased by the summer of 1976, possibly due to the unfavourable weather prevailing during the swarming periods. In addition, an exceptionally large number of dead spruce trees were found on dry sites in the coastal region of southern Finland in 1974–75. The trees were infested by *I. typographus* and *Pityogenes chalcographus* and occasionally by *Polygraphus* sp. In Kittilä, northern Finland, spruce trees killed by *I. typographus* were found in 1975 over an area of about 6 000 hectares. In southern Finland and Norway, *Scolytus ratzeburgi* Jans. attacked a large number of birch trees during the same period.

Pine shoot damage caused by *Tomicus piniperda* L. and *T. minor* Hart., which is a problem in the Nordic Countries (cf. Salonen 1973), continued to occur throughout the period in question. In Finland and Sweden, however, the amount of damage caused by *Tomicus* spp. declined slightly towards the end of the period. This may be a result of the increasing interest in forest sanitation, and in Finland also partly due to a reduction in logging activities. The increment losses caused by *Tomicus* spp. have been investigated by Nilsson (1974) and Andersson (1974). In addition to attacking *Pinus sylvestris, Tomicus* spp. have also damaged *P. contarta* in the Nordic Countries.

Tomicus piniperda has been reported as a stem pest associated with dying trees in pine stands suffering from defoliation caused by *Lymantria monacha* L. in southern Sweden.

The extremely dry conditions in Denmark also caused widespread occurrence of the elm scolytid *Scolytus laevis* Chap. Dutch Elm disease was, however, not found (Bejer-Petersen & Pedersen 1976).

Bark beetles also caused extensive damage to unbarked timber, *Trypodendron lineatum* Oliv. being the most destructive (Annila et al. 1972, Uusvaara & Löyttyniemi 1975). In addition, many scolytid species which live under the bark caused a considerable amount of damage to timber as attack by the beetle results in blue-staining and an increased rate of decay (Uusvaara & Löyttyniemi 1977, Löyttyniemi et al. 1978).

A survey of the distribution of the Nordic bark beetles was recently published by Lekander et al. (1977).

22. Defoliators

Hymenoptera. Of the defoliators, *Neodiprion sertifer* Geoffr. caused the most widespread damage in the Nordic Countries during the period in question. Outbreaks of this species, which started in pine forests in Central Finland at the end of the 1960s, were still continuing in 1972–73 over an area of about 5 000 ha. Control measures using a commercial polyhedrosis virus preparation were carried out in 20 ha of forest. A new outbreak occurred in the northern part of Central Finland in 1973, which by 1975 had extended to an area of about 30 000 ha. Virus treatment was carried out locally in 1975 in 300 ha of forest, resulting in a larval mortality of 90 %. Abundant populations of *N. sertifer* were also reported locally in North Finland in 1973–74.

In Norway, *N. sertifer* occurred in large numbers especially in 1973–74, when control measures with a virus preparation were carried out on 300 ha of forest (Austarå 1975). Local mass outbreaks of *N. sertifer* occurred every year in Sweden throughout the five-year period, the most serious outbreaks affecting 5 000 ha of forest in Central Sweden in 1973. A virus preparation was subsequently used there in 1974 over 100 ha of forest. *N. sertifer* outbreaks were also reported from Denmark during the period in question.

The outbreak of *Diprion pini* L. (cf. Ehnström et al. 1974) continued in 1972, affecting 100 ha of forest in western Finland, and there was still a large population in the area in the latter years of the period. An outbreak also occurred in southern Sweden in 1976. *Diprion butovitschi* Hedqv. damaged pines over a wide area in northern Sweden in 1975. Considerable damage was also caused to young *Pinus sylvestris* stands by *Microdiprion pallipes* Fall. in

this area in 1975 and 1976. Of the Tenthredinidae species, *Arge pullata* Zadd. defoliated birch over an area of 250 ha in Sjelland, Denmark, during 1972–73.

Lepidoptera. The damage caused by lepidopterous defoliators during the period in question was rather slight. An outbreak of *Lymantria monacha* L. affected some hundred hectares of coniferous forest in Denmark during 1972–74. It was controlled by aerial spraying of insecticides, NPV-virus and *Bacillus thuringiensis* (Bejer-Petersen 1974a, Zethner 1976). *Epirrita (Oporinia) autumnata* Bkh. did not cause any widespread damage to foliage in mountain birch forests, although localized outbreaks were reported in Norway and northern Sweden during 1974–76. Localized outbreaks of *Tortrix viridana* L. occurred in *Quercus* forests in southern Sweden and southern Norway, and *Yponomeuta* sp. defoliated *Prunus padus* and *Sorbus aucuparia* in Central Sweden and southern Finland.

23. Other important pests

Hylobius abietis L. continued to be one of the most destructive forest pests in the Nordic Countries. This species has damaged great numbers of young coniferous trees on reforestation sites. In Sweden, the banning of DDT in the control of this pest has made reforestation even more difficult than before. Many insecticides and other protection measures have been tested (Eidmann 1975) but no substitute for DDT has yet been approved. In Finland lindane was used for pretreatment of plants, in Denmark and Norway DDT.

Damage caused by *Strophosomus capitatus* DeGeer, *Hylastes brunneus* Er. and *Hylastes cunicularius* Er. on coniferous trees also increased in Sweden along with the phasing out of chemical protection measures. Similar reports have also come from Finland and Denmark. In the latter country, *Strophosomus melanogrammus* Forster also caused damage during this five-year period. In 1976, *Agrotis segetum* Den. & Schiff. caused damage to seedlings and young trees in several nurseries in southern Norway. In one nursery, the damage amounted to approx. N.Kr. 250 000. Attacks of *Agrotis* species were also reported from nurseries in Denmark in 1975–76.

Aradus cinnamomeus Panz. occurred continuously in young pine stands, especially those growing on poor sandy soils in southern and central Sweden (cf. Brammanis 1975). Localized infestations of the species also occurred in southern Finland and Norway (Pettersen 1975). Large numbers of *Rhyacionia buoliana* Den. & Schiff. occurred in pine plantations, particularly in Denmark, during this period (cf. Bejer-Petersen 1972), and locally in southern Norway, southern and central Sweden and Gotland. In addition to attacking *Pinus sylvestris, R. buoliana* has also been found on *P. mugo* and *P. contorta* in Sweden. *Exoteleia dodecella* L. attacked pines in certain areas in southern Norway during 1972–75 (Hågvar et al. 1976), and in the vicinity of an industrial area in western Finland.

Cone and seed insects continued to cause damage in forests and seed orchards in the Nordic Countries. Their occurrence and control was studied in Finland during the period in question (Annila 1973, 1975, 1977). The species causing the most damage to spruce were: *Cydia (Laspeyresia) strobilella* L., *Dioryctria abietella* Den. & Schiff. and *Hylemyia anthracina* Czerny. *Pissodes validirostris* Gyll. destroyed cones especially in seed orchards. In Norway, a control study was undertaken in 1976 (Pettersen & Tho 1976). Some carabid species among the insects destructive to sown conifer seed have been found in Finland (Heikkilä 1977).

Little attention has so far been paid in the Nordic Countries to pests of young deciduous trees. However, the importance of these pests has increased in Finland during the 1970s owing to the afforestation of abandoned fields and the introduction of short rotation forestry in Sweden and Finland.

Phyllobius maculicornis Germ. and *P. piri* L. caused severe defoliation of birch seedlings in stands established on fields in southern and central Finland. These weevils were also abundant in Sweden (Axelsson et al. 1973). *Cicadella viridis* L. caused stem damage on birch and alder seedlings (Juutinen et al. 1976); *Saperda populnea* L. and *S. carcharias* L. damaged *Populus* plantations in Finland and Sweden (Löyttyniemi 1972); *Melasoma populi* L. and *Phyllodecta vitellinae* L. defoliated *Populus tremula* in Sweden. *Alnus incana* was defoliated

by *Galerucella lineola* F. over large areas in Norway, and to some extent in Sweden, and by *Agelastica alni* L. in Denmark and Sweden as well as over a large part of south-eastern Finland. Widespread defoliation of young *Betula* sp. by *Lochmaea betulae* L. occurred in southern Sweden in 1972. The cecidomyid species, *Rhabdophaga terminalis* H., occurred in large numbers in willow plantations in Sweden during 1975–76.

Aphids caused more damage than usual during the five-year period owing to the warm and dry summers. Adelgidae damaged spruce plantations in the southern and central parts of the region in a number of years. *Pineus pini* L. was frequently found on pine in all the Nordic Countries, and was also reported to have attacked *Pinus mugo*. *Aphrastasia pectinatae* Chol. occurred on *Abies* species throughout southern Norway and southern Finland, and *Dreyfusia nordmannianae* Eckst. was a very serious problem in Denmark and to some degree also in southern Sweden and Norway (cf. E i d m a n n & E h n s t r ö m 1975). *Liosomaphis abietina* Walk. caused considerable damage, especially in 1973, to *Picea sitchensis* in Denmark and southern Norway. During 1975 and 1976 extensive damage also occurred in northern Norway. *Gilletteella cooleyi* Gill. damaged *Pseudotsuga menziesii* in Norway.

Of the scale insects, *Cryptococcus fagi* Bär. was found in large numbers on *Fagus silvatica* in southern Sweden and southern Norway, and especially in Denmark it became a very serious problem in the latter part of the period referred to here. As regards to phytophagous mites, *Oligonychus ununguis* Jacobi and some Eriophyidae species damaged *Picea abies* seedlings in nurseries in southern and central Finland during 1972–73 (cf. L ö y t t y n i e m i 1975). In comparison to the damage caused by mites in the 1960s, the damage in Finnish nurseries decreased, owing to improvements in nursery techniques and prophylactic treatments with acaricides. *O. ununguis* also caused damage in spruce plantations in southern Finland during 1972–73. Damage was also reported on *Picea sitchensis* plantations in Norway. In 1972–73, large numbers of *Metatetranychus ulmi* Koch. were found throughout southern Finland where they caused premature leaf discolouration of *Alnus incana* over a wide area (L ö y t t y n i e m i & T u l i s a l o 1974). Large numbers of *Eotetranychus tilarium* Hermann were reported on *Tilia cordata* in Denmark in 1975.

3. OTHER ATTACKS REPORTED

The reported occurrence of other forest insect pests during the five-year period is listed in the following table.

Table 1. Forest pest insects of minor importance reported in the Nordic Countries 1972–76.
Taulukko 1. Vähemmän merkittävien metsien tuhohyönteisten esiintyminen Pohjoismaissa 1972–76.

Insect species *Hyönteislaji*	Hosts *Puulaji*	Locality *Paikka*	Remarks *Huomautuksia*	Year *Vuosi*	Reference *Lähdeviittaus*
HEMIPTERA					
Cinara sp.	*Picea abies* *Pinus sylvestris*	Finland	Attacks reported	1973	
Cinaropsis sp.	*Picea abies*	Denmark	Attacks reported	1972	Bejer-Petersen 1973
Cinara abieticola Chol.	*Abies sibirica*	S Finland	Attack reported	1973	
Cinaria cembrae Chol.	*Pinus sylvestris*	M Sweden	Attack reported	1974	
Diaspididae sp.	*Pinus sylvestris*	S Finland M Sweden	Attack reported Attack reported	1972 1973	
Lachnidae sp.	Deciduous trees *Picea abies*	Finland Denmark	Attacks reported Attacks reported	1973 1976	

Insect species *Hyönteislaji*	Hosts *Puulaji*	Locality *Paikka*	Remarks *Huomautuksia*	Year *Vuosi*	Reference *Lähdeviittaus*
Matsucoccus sp.	*Pinus sylvestris*	S Finland	Attacks reported	1972–73	Löyttyniemi 1978
Mindarus abietinus Koch	*Abies alba* *Abies nordmanniana*	Denmark	Attacks reported	1973	Bejer-Petersen 1974b
Mindarus obliquus Chol.	*Picea alba* *Picea sitchensis*	Denmark	Attacks reported	1973	Bejer-Petersen 1974b
Phyllaphis fagi L.	*Fagus silvatica*	Denmark	Locally controlled	1976	Bejer-Petersen 1977
COLEOPTERA					
Brachyderes incanus L.	*Picea abies*	M Norway	Attack on young stand	1975	
Cryptocephalus pini L.	*Pinus sylvestris*	N Finland	Attack on young peatland stands	1974	
Cryptorrhynchus lapathi L.	*Salix* sp.	S Sweden	Abundant occurrence on one stand	1975	
Luperus pinicola Duft.	*Pinus sylvestris*	N Finland	Attacks on young stands	1975	
Melolontha hippocastani F.	*Picea abies*	Norway	Attack in nursery	1973	
Phaenops cyanea F.	*Pinus sylvestris*	M Sweden	Attacks on stands suffering from drought	1975–76	
Pissodes pini F.	*Pinus sylvestris* *Picea abies*	N Finland	Attacks on young seedlings	1972	
Pissodes piniphilus Hrbst.	*Pinus sylvestris*	M Finland	Attack reported	1973	
Polydrosus atomarius Ol.	*Abies nordmanniana*	Denmark	Attack on christmas tree plantation	1976	Bejer-Petersen 1977
LEPIDOPTERA					
Argyresthia goedartella L.	*Alnus* sp.	S and M Sweden	Abundant occurrence	1972	Juutinen 1974
Blastethia turionella L. (*turionana* Hb.)	*Pinus sylvestris*	S Norway	Attack reported	1974	
Blastotere glabratella Z	*Picea abies*	M Sweden	Attack in young stand	1973	
Coleophora laricella Hb.	*Larix* sp.	M Norway S Sweden	Attack reported Attack reported	1972 1975	
Cossus cossus L.	Deciduous trees	S Norway	Attack reported	1975	
Dasychira pudibunda L.	*Fagus silvatica*	S Sweden	Defoliation over a few hectares	1972	
Dioryctria sylvestrella Rtzb. (*splendidella* HS.)	*Pinus sylvestris*	S Norway	Attack reported	1975	
Epinotia proximana HS.	*Abies* sp.	Denmark	Attack and control reported	1972–73	Bejer-Petersen 1973, 1974b
Erannis sp.	Deciduous trees	M Sweden	Attack reported	1973	

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Insect species *Hyönteislaji*	Hosts *Puulaji*	Locality *Paikka*	Remarks *Huomautuksia*	Year *Vuosi*	Reference *Lähdeviittaus*
Eriocrania sp.	*Quercus* sp.	S and M Sweden	Abundant occurrence	1972	
Ochropleura fennica Tausch.	*Pinus contorta* *Betula* sp. *Salix* sp.	M Sweden	Attack reported	1976	
Operophtera sp.	Deciduous trees	M Sweden	Local defoliation	1972–73	
Operophtera fagata Scharf.	*Betula* sp.	M Sweden	Local defoliation	1976	
		S Finland	Local defoliation	1975	
Orgyia antiqua L.	*Picea abies*	M Norway	Attack reported	1972	
Petrova resinella L.	*Pinus sylvestris*	N Finland	Attacks in young stand	1975	
Rhyacionia duplana Hb.	*Pinus sylvestris*	M Sweden	Attack reported	1975	
Stenolechia gemmella L.	*Quercus* sp.	SW Finland	Abundant occurrence	1972	
		S and M Sweden	Abundant occurrence	1972–73	
Zeiraphera rufimitrana HS.	*Abies* sp.	Denmark	Attack and control reported	1973–75	Bejer-Petersen 1974b, 1975, 1976b
DIPTERA					
Thecodiplosis branchyntera Schwaeg.	*Pinus sylvestris*	W Finland	Attack on young trees round an industrial area	1972	
		S Norway	Attack reported	1974	
HYMENOPTERA					
Acantholyda hieroglyphica Chr.	*Pinus sylvestris*	S and M Sweden	Attacks reported	1974–76	
Caliroa sp.	*Sorbus* sp. *Crataegus* sp.	M Sweden	Attack reported	1972	
Croesus septentrionalis L.	*Betula* sp.	N Finland	Defoliation over a few hectares	1975	
Gilpinia socia Klug	*Pinus contorta*	Sweden	Attack reported	1973	
Pristiphora abietina Christ.	*Picea abies*	M Finland	Attacks on plantations	1972–75	Bejer-Petersen 1975
		Denmark		1974	
Pristiphora erichsoni Htg.	*Larix* sp.	N Sweden	Attacks reported	1973–74	
		W Norway	Attack reported	1974–75	
		Denmark	Attack reported	1975	
Pristiphora wesmaeli Fischb.	*Larix* sp.	Sweden	Abundant occurrence	1974	
Trichiocampus sp.	*Populus tremula*	M Sweden	Attack reported	1972	
ACARINA					
Eriophyes leionotus Nal.	*Betula* sp.	M Norway	Attack reported	1975	
Tetranychus urticae Koch	*Betula verrucosa* *Populus* sp.	S Finland	Infestation on seed trees in a greenhouse	1972–73	Löyttyniemi & Tulisalo 1974

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5. SELOSTE

Esitetty selonteko tuhohyönteisten esiintymisestä Pohjoismaiden metsissä vuosina 1972–76 on jatkoa aikaisemmille, jotka ovat käsitelleet vuosia 1961–66 ja 1967–71 (Christiansen 1970, Ehnström ym. 1974).

Suurimmat ongelmat nyt kysymyksessä olevan kauden aikana aiheutti kirjanpainaja *(Ips typographus* L.); 1960-luvun lopulla sattuneiden myrsky- ja lumituhojen seurauksena alkuun päässyt kuusikoiden kuivuminen Etelä- ja Keski-Ruotsissa ja eräin paikoin Norjassa jatkui saavuttaen huipun 1972. Vielä 1976 Ruotsissa kuivui 150 000 m^3 ja Norjassa 40 000 m^3 kuusimetsää. Samoilla alueilla esiintyneet kuusen tähtikirjaajan *(Pityogenes chalcographus* L.) aiheuttamat tuhot etenkin nuorissa kuusikoissa sitä vastoin loppuivat pääosin jo 1972. Kaarnakuoriaistuhoja esiintyi laajassa mitassa myös Tanskassa kuivuudesta kärsineissä kuusikoissa.

Vaikka pääosa myrskyn kesällä 1972 Kaakkois-Suomessa vioittamasta puustosta saatiin nopeasti korjattua, jäi kaarnakuoriaisille sopivaa lisääntymismateriaalia kuitenkin metsään. Tämän ja lämpimän kesän 1973 seurauksena kirjanpainajakannat alueella lisääntyivät ja kuusten kuivumista sattui 1974–75 tavanomaista enemmän. Ilmoituksia saatiin noin 100 kuivuneesta kuusikosta.

Kroonisen ongelman muodostavien ytimennävertäjien *(Tomicus piniperda* L. ja *T. minor* Hart.) aiheuttamat männyn versotuhot jatkuivat jokseenkin entisessä laajuudessa. Suomessa vahingot kauden loppupuolella kuitenkin hieman vähenivät johtuen laimentuneesta hakkuutoiminnasta ja siitä, että kuorellisen mäntypuutavaran varastoimista metsään on pyritty vähentämään.

Lehti- ja neulastuholaisista aiheutti laajimmat tuhot ruskea mäntypistiäinen *(Neodiprion sertifer* Geoffr.). Tämän lajin 1960–1970 -lukujen vaihteessa alkanut joukkoesiintyminen Keski-Suomessa jatkui 1972 (osittain vielä 1973) noin 5 000 ha:n alueella. 1973 syntyi uusi esiintymä Oulujärven ympäristössä, mikä vuoteen 1975 mennessä laajeni noin 30 000 ha:n alalle. Norjassa ruskeaa mäntypistiäistä esiintyi runsaasti etenkin 1973–74. Ruotsissa tuhoja sattui kaikkina vuosina, laajimpien (n. 5 000 ha) tuhojen esiintyessä Keski-Ruotsissa 1973. Kaikissa kolmessa maassa mäntypistiäistä torjuttiin pienehkössä mitassa viruspreparaattia käyttäen. Tunturimittari *(Epirrita autumnata* Bkh.) esiintyi 1974–76 suhteellisen runsaasti Norjan ja Ruotsin tunturikoivikoissa, mutta ei aiheuttanut laajoja tuhoja.

Eräs kaikkein vahingollisimpia tuholaisia kaikissa Pohjoismaissa oli jatkuvasti tukkimiehentäi *(Hylobius abietis* L.), joka aiheuttaa vahinkoja nuorissa havupuiden, etenkin männyn taimistoissa. Erityisesti Ruotsissa metsänviljely vaikeutui tukkimiehentäin vuoksi, koska DDT:n käyttö kiellettiin 1975, eikä muuta vastaavanlaista suojausmenetelmää ollut käytettävissä. Kemiallisesta suojauksesta luopumisen myötä lisääntyivät Ruotsissa myös eräiden muiden kärsäkkäiden ja juurinilurien *(Hylastes)* männyn viljelyaloilla aiheuttamat vahingot.

Varttuneemmissa männyn taimistoissa on etenkin kuivilla hiekkakankailla sattunut punalatikan *(Aradus cinnamomeus* (Panz.) tuhoja Etelä- ja Keski-Ruotsissa. Laji on esiintynyt runsaana paikoitellen myös Etelä-Suomessa ja Norjassa. Havupuiden siemen- ja käpytuholaiset aiheuttavat metsissä ja siemenviljelmillä jatkuvasti vahinkoja.

Lehtikärsäkkäät *(Phyllobius maculicornis Germ.* ja *P. piri* L.) aiheuttivat pelloille istutetuissa koivun taimistoissa Keski-Suomessa haitallisia lehtituhoja. Lämpimistä ja kuivista kesistä johtuen kirvoja esiintyi puheena olevina vuosina tavallista enemmän.

Edellisten lisäksi on tekstissä ja taulukossa tietoja useamman kymmenen muun vähemmän merkittävän tuhohyönteisen esiintymisestä.

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Authors' addresses: Löyttyniemi, K. Finnish Forest Research Institute, Unioninkatu 40 A, SF-00170 Helsinki 17, Finland. Austarå, Ø. Norwegian Forest Research Institute, Box 61, 1432 Ås-NLH, Norway. Bejer, B. Royal Veterinary and Agricultural University, Bülowsvej 13, DK-1870 Copenhagen V, Denmark. Ehnström, B. Swedish University of Agricultural Science, Box 50026, S-104 05 Stockholm, Sweden.

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