

Empididae (Diptera) of Finland: The *Empis* subgenera *Empis* and *Coptophlebia*

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Nine species of *Empis* (*Empis*) and one of *E.* (*Coptophlebia*) have been found to occur in Finland. Of these only three (*E. (E.) pennipes*, *E. (E.) nigripes* and *E. (E.) bicuspidata*) are very common. The last mentioned is the only one known throughout the country including the extreme north. Two species (*E. (E.) nigripes* and *E. (E.) laminata*) are distributed to approximately 65°N. With the exception of *E. (E.) staegeri*, which has been found in Åland, in the extreme south-west only, the majority of species inhabit southern and central parts of Finland to approximately 62°N.

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1. Introduction

The last available systematic treatment of the Finnish species of the genus *Empis* is that of Frey (1913), who presented at that time, within a revision of the family Empididae in its broad sense, a list of all species found in Finland. Each species was documented by a full list of localities and collectors, so such an arrangement enabled a simple revision to be made of Frey's identifications in the recent "Finnish Collection" preserved in the Helsinki Museum.

Since 1913 the genus *Empis* has not been thoroughly studied in Finland and no further data are available — except for several more or less general local faunistic or ecological papers published incidentally by O. Ringdahl, R. Tuomikoski and W. Hackman. The few taxonomic papers on

the Finnish Empididae s.lat. published by R. Tuomikoski (in 7 parts) between 1935 and 1966 dealt mainly with the recent family Hybotidae, except for the empidid genera *Hormopeza* (Oreogetoninae) and *Chelifera* (Hemerodromiinae).

During the preparational work on the 3rd "empidid" volume on *Empis* for the 'Fauna Entomologica Scandinavica', to be published in 1992, I have also revised the Finnish Collection in the Helsinki University Museum. The specimens of *Empis* were revised during my short stays in Helsinki in 1980 and 1990, but the large collection of the taxonomically difficult subgenus *Empis* was sent to me for detailed study in 1989. As the scope of the series 'Fauna Entomologica Scandinavica' is limited, the more complete results of my studies are presented here.

2. The *Empis* subgenera *Empis* and *Coptophlebia*

The subgenus *Empis* includes, as does *Coptophlebia*, small black to greyish coloured species of body length 2 to 5 mm. Eyes are holoptic in males with upper facets very enlarged, females have legs usually more or less pennate, and the long vertical proboscis on head and the widely open radial fork on wing (veins R₄ and R₅) represent the main differential characters. The only (rather weak) differential feature between *Empis* and *Coptophlebia* is the apically abbreviated vein M₁ on wing in the latter. The "subgeneric" classification of *Empis* and *Coptophlebia* seems to be unnatural and rather artificial (in comparison with other subgeneric classification within the genus *Empis*), but it is still generally accepted for practical purposes.

Considering the widely open radial fork and the above characteristics, the species of *Empis* and *Coptophlebia* could hardly be misidentified, with the possible exception of the small species of *Hilara* (Empidinae) and some genera of the Oreogetoninae. Both have, however, an acute radial fork on wing, and thoracic metapleura is bare. The *Hilara* species differ also, inter alia, in the concave base of the upper vein (R₄) of the radial fork, the dichoptic eyes in males, and the short proboscis. The small-sized Oreogetoninae (*Ragas*, *Hormopeza*, *Iteaphila*) have proboscis more or less pointing forwards, and the precoxal bridge is not developed, i.e. the prosternum between fore coxae is very small and isolated.

Frey (1913) recognized 6 species of the subgenus *Empis* in Finland (classified in the subgenus *Pterempis* Bezzi) — *E. cinerea* Zett., *E. pennipes* L., *E. plumipes* Zett., *E. vernalis* Meig., *E. chioptera* "Fall." and *E. prodromus* Loew; and one species of the subgenus *Coptophlebia* Bezzi, *E. hyalipennis* Fall. However, when checking the present state of the "Finnish Collection" in Helsinki, it did not correspond with Frey's original (1913) classification. The "*E. vernalis* Meig." (a junior synonym of *E. nigripes* F.) sensu Frey has been later replaced by 4 separate taxa: *E. pennaria* s.lat., *E. pennaria* Fall., *E. bicuspidata* Coll. and *E. planetica* Coll. The revised identification was very probably carried out by R. Frey himself sometime after Engel's (1946) elaboration of the

genus *Empis* in Lindner's 'Die Fliegen der Palaearktischen Region' appeared, and prior to 1954, when Frey was asked by E. Lindner to continue with *Empis* in that monograph.

Actually, both Frey's "*E. vernalis*" and the later complex of *pennaria*, *bicuspidata* and *planetica* of the former "*vernalis*", was a mixture of several closely related species. It was clearly evident that the identifier, either R. Frey or somebody else, did not have a clear concept of the taxonomy of the *E. nigripes*-complex. *Empis pennaria* Fall. (a junior synonym of *E. nigripes* F.) and *E. pennaria* s.lat. included many species, but predominantly both sexes of *nigripes* and *laminata*, and females of *bicuspidata*. *Empis bicuspidata* was represented mainly by males of *bicuspidata*, females of practically all species of the *E. nigripes*-complex, and by several specimens of *hyalipennis* (*Coptophlebia*). Even *E. chioptera* and *E. prodromus* were not correctly separated. Females of *E. cinerea* (now *E. acinerea*) were included mostly under "*E. pennaria*", but *E. plumipes* (now *E. syrovatkai*) was generally correctly identified, as well as *E. pennipes*. On the other hand *E. staegeri* was misidentified as *E. planetica*. The subgenus *Coptophlebia* is represented in Finland by a single species (*E. hyalipennis*), as already established by Frey (1913).

3. List of species

The following list of species of the subgenera *Empis* and *Coptophlebia*, with lists of Finnish localities (collectors omitted, only provinces for common species), is based on the "Finnish Collection" as it has been preserved for the last twenty years, together with all accessible unidentified specimens found in the collections of the Zoological Museum, Helsinki. Unfortunately, it was the custom during the time of Frey, Sahlberg, Hellén, Palmén, Poppius, Woldstedt, Lundström and others, not to give the date of capture on locality labels. For this reason the dates quoted for occurrences in Finland are based mainly on specimens collected recently by, for instance, Lindberg, Nordman, Krogerus, Fagerström, Tiensuu, Tuomikoski, Albrecht, and others. As these data are consequently rather incomplete, the dates of occurrence in other Scandinavian coun-

tries including Denmark are given by way of comparison for each species, as well as a brief paragraph on the distribution outside Finland.

Empis (Empis)

In terms of their abundance the Finnish *Empis (Empis)* species may be roughly separated into two groups. Three species (*pennipes*, *nigripes*, *bicuspidata*) are very common, and more than 200 specimens of each were examined from Finland. The remaining six species are much less common, and they were represented in the Helsinki Collections by 23 (*chiotera*) to 61 (*prodromus*) specimens.

Most of the species are distributed over the southern and central parts of Finland, north to *Om*, *Sb* and *Kb*, approximately to 63–64°N. *E. laminata* reaches the Arctic Circle, as does *E. nigripes* in Finland, though the latter has a more northerly distribution outside Finland, reaching, like *E. bicuspidata*, the extreme north of Fennoscandia. The only really southern species of the Finnish fauna is *E. staegeri*, known so far from Åland only. Practically all species of the subgenus occurring in Finland are typical spring or at most early summer species, except for *E. syrovatkai*, which is a characteristic late summer species.

There are a further six species of the subgenus *Empis* found in the southern parts of Scandinavia but not recorded from Finland. Of these perhaps only *E. aestiva* Loew might occur in the south of Finland. It is a very common species in Denmark, in Norway it is distributed to *HOy* and *AK* (approximately 60°N), and it is fairly common in southern Sweden, north to *Vg* and *Ög*, and found also on Öland and Gotland. *E. aestiva* is a summer species (in Scandinavia from 17 June to 23 August) and it could easily reach Finland either along the eastern coast of Sweden or from the north-west of the European USSR. For completeness the species is incorporated in the Key to the identification of Finnish species given below.

The other species, viz. *E. caudatula* Loew, *E. nuntia* Meigen, *E. planetica* Collin, *E. rufiventris* Meigen and *E. serotina* Loew, are known only from the warmer areas of Denmark and the extreme south of Sweden, and their occurrence in Finland is unlikely. This applies also to *E. planetica* which was mistakenly recorded from Finland by Hackman (1980), a mistake based on a false

identification in the Finnish Collection, and unfortunately recently adopted even in the Palaearctic Catalogue (Chvála & Wagner, 1989).

Empis (Empis) acinerea Chvála, 1985

Al: Lemland Flaka. *Ab*: Lohja, Vihti. *Ta*: Pirkkala, Kangasala, Loppi Sajaniemi. *Sa*: Joutseno. *Tb*: Jyväskylä. *Sb*: Leppävirta. *Kb*: Liperi, Kontiolahti. — *Vib*: Käkisalmlä (now Priozersk), Pyhäjärvi (now Otradnensk). *Kr*: Sortavala, Äänislinna (now Petrosawodsk), Kolatselkä, Kurkijoki. — Altogether 51 specimens (31 ♂♂ and 20 ♀♀) on dates ranging from 26 May to 24 June.

Within Fennoscandia rather common in Finland only (Fig. 1), otherwise known only from a few localities in Denmark and southern Sweden (5 ♂♂ and 6 ♀♀ only!); also the Netherlands and Central Europe. The earliest date of capture in Denmark is 22 May.

Empis (Empis) bicuspidata Collin, 1927

Al, *Ab*, *N*, *Ka*, *Ta*, *Sa*, *Oa*, *Tb*, *Kb*, *Om*, *Ok*, *ObN*, *Ks*, *LkE*, *Li*, *Le*. — *Vib*: Hogland (now Gogland), Lavansaari (now o. Moščnyi), Valkjärvi (now Mičurinskoe), Metsäpirtti (now Zaporozskoe), Sakkola (now Gromovsk), Konevitsa. *Kr*: Paanajärvi, Suistamo, Sortavala, Swir, Hiitola, Impilahti, Äänislinna (now Petrosawodsk). *Lr*: Ponoj. — Altogether 202 specimens (134 ♂♂ and 68 ♀♀) on dates from 27 May to 6 July.

A widely distributed species in Fennoscandia including the extreme north, though much less common towards south (Fig. 2); rather a boreal species. Mainly in June and July, in Lapland up to 6 August. It is known also from the British Isles and the Netherlands, and south to Central Europe (Czechoslovakia), where it is rather rare.

Empis (Empis) chiotera Meigen, 1804

Ab: Vihti, Lohja. *N*: Helsinki, Espoo, Kirkkonummi. *Kb*: Kontiolahti. — *Kr*: Sortavala, Salmi. — Altogether 23 specimens (14 ♂♂ and 9 ♀♀) on dates ranging from 16 May to 4 June.

A common species in Denmark and the extreme south of Sweden (north to *Hall* and *Sm*), though found also in Norway north approximately to 59°N (*Ve*, *AK*). East Fennoscandian distribution in Fig. 3. Very early spring species, usually the first species of the subgenus in spring, in the south of Scandinavia from 4 May, individually up to 27

June. In warm and temperate Europe very common.

Empis (Empis) laminata Collin, 1927

Al: Eckerö, Saltvik, Finnström, Sottunga-Husö. *Ab*: Muurla Eriksberg, Uskela. *N*: Helsinki, Kirkkonummi. *Sr*: Pori. *Oa*: Lapua, Korsholm Norrskär. *Om*: Jakobstad. *Ok*: Suomussalmi. *ObS*: Liminka. *ObN*: Rovaniemi. — *Vib*: Metsäpirtti (now Zaporozkoe), Muolaa (now Kirillovskoe). *Kr*: Jalguba, Paadana, Svätnavolok, Impilahti, Tschuja. — Altogether 35 specimens (22 ♂♂ and 13 ♀♀) on dates ranging from 4 June to 22 July.

Mainly in June and July, though in southern Sweden (Skåne) found as early as 4 May. Widespread in Scandinavia but everywhere rather rare. It has been recorded from Denmark (6 ♂♂ and 10 ♀♀), and throughout Sweden from *Sk* to *Nb*, but as 7 males only. Not yet recorded from Norway or the British Isles. East Fennoscandian distribution in Fig. 4. Generally misidentified as *E. nigripes*. Besides Fennoscandia and Denmark found up to now only from the Netherlands and Czechoslovakia.

Empis (Empis) nigripes Fabricius, 1794

Al, Ab, N, Ka, St, Ta, Sa, Oa, Tb, Sb, Kb, Om, Ok, ObN: Pisavaara naturpark, Rovaniemi. — *Vib*: Vyborg, Kivennapa (now Pervomajskoe), Sakkola (now Gromovsk), Valkjärvi (now Mičurinskoe), Metsäpirtti (now Zaporozkoe), Muolaa (now Kirillovskoe). *Kr*: Paanajärvi, Sortavala, Svätnavolok, Petrosawodsk, Impilahti, Hiitola, Suistamo, Jalguba. *Lr*: Maaselgä, Yläluostari (now Zapoljarnyi), Petsamo (now Pecenga). — Altogether 260 specimens (139 ♂♂ and 121 ♀♀) on dates ranging from 5 June to 10 July.

Together with *E. pennipes* the commonest species of the subgenus *Empis* in Fennoscandia and Denmark, and practically throughout Europe except for the Mediterranean. In Fennoscandia mainly in June, on dates ranging from 18 May to 11 August. Fairly common even in the extreme north, found also in Norwegian, Swedish and Russian Lapland, though the northernmost known locality in Finland is Rovaniemi in *Ob* (Fig. 5).

Empis (Empis) pennipes Linnaeus, 1758

Al, Ab, N, Ka, St, Ta, Sa, Tb: Laukaa, Jyväskylä. *Sb*: Kuopio, Tuovilanlahti, Leppävirta, Nilsjä. *Kb*: Kontiolahdi, Koli. — *Vib*: Vyborg. *Kr*: Munjärvi, Sortavala, Hiitola, Suistamo, Impilahti, Petrosawodsk, Fl.Swir, Jalguba,

Svätnavolok, "Carelia ross". — Altogether 263 specimens (106 ♂♂ and 157 ♀♀) on dates ranging from 8 June to 1 July.

Rather a southern species in distribution within Scandinavia, in Norway north to *Nsy*, in Sweden to *Dlr*, at most approximately 65°N, common in Denmark and in the south. East Fennoscandian distribution in Fig. 6. Mainly in June, in Scandinavia on dates ranging from 11 May to 27 July. Practically throughout Europe, very common in Central Europe.

Empis (Empis) prodromus Loew, 1867

Al: Jomala. *Ab*: Lohja, Karjalohja, Kuusisto, Sammatti, Naantali, Nagu Högsar. *N*: Vantaa, Hanko Tvärminne, Ekenäs, Lappvik, Kauniainen. *Ka*: Virolahti. *Ta*: Kangasala, Forssa, Hausjärvi, Padasjoki. *Sa*: Joutseno. *Tb*: Jyväskylä. *Kb*: Ilomantsi, Eno. — *Vib*: Vyborg, Käkisalmi (now Priezorsk) Kivennapa (now Pervomajskoe), Metsäpirtti (now Zaporozkoe). *Kr*: Suistamo. — Altogether 61 specimens (32 ♂♂ and 29 ♀♀) on dates ranging from 18 June to 17 July.

In Scandinavia common species in the south, especially in Denmark and southern Sweden, rare in its central parts, in Sweden north to approximately 64°N (*Ås.Lpm*). It has not yet been recorded in Norway, though it should occur there, at least in the south. East Fennoscandian distribution in Fig. 7. A typical spring species, in Scandinavia mainly in June, in Denmark taken as early as 30 May. From the British Isles and central parts of Scandinavia south to central parts of Europe.

Empis (Empis) staegeri Collin, 1963

Al: Saltvik, Mariehamn, Jomala, Äppelö, Eckerö, Lemland. — Altogether 38 specimens (27 ♂♂ and 11 ♀♀); only one date of capture available, 10 June.

A species of southern distribution in Scandinavia, not uncommon in Denmark and in the south of Sweden, north in Norway to *AK*, in Sweden to *Dlr*, eastwards through *Upl* to the Finnish Åland (Fig. 8). A typical spring species, in Denmark and southern Sweden from 18 May to 1 July, mainly in June. Uncommon in Central Europe, but unknown from the British Isles and the Netherlands.

Empis (Empis) syrovatkai Chvála, 1985

Ab: Karjalohja, Vihti, Kemiö. *N*: Helsinki, Espoo. *Ka*: Vehkalahti. *Sr*: Yläne. *Ta*: Ylöjärvi. *Sa*: Joutseno. *Tb*: Jyväskylä. *Sb*: Tuovilanlahti. *Kb*: "Carelia bor.". *Om*: Nykarleby. — *Vib* Vyborg. *Kr*: Salmi, Suistamo, Nurmoila,

Säntämä. — Altogether 40 specimens (21 ♂♂ and 19 ♀♀) on dates ranging from 31 July to 22 September.

Widespread in Scandinavia, though everywhere uncommon. It has been found in Denmark, in Norway north to *SFi* and *On*, in Sweden to *Jmt*, approximately 62°N. East Fennoscandian distribution in Fig. 9. A typical summer species, mainly in July and August in Fennoscandia, the earliest record is from Norway on 2 July. From Central Europe north to the Netherlands and central parts of Fennoscandia, unknown from the British Isles.

Empis (Coptophlebia) Bezzi

There are two species of the subgenus *Coptophlebia*, *E. albinervis* Meigen and *E. vitripennis* Meigen known from Denmark and the south of Scandinavia. Their occurrence in Finland is very unlikely. Both are typical summer or late summer species, easily differentiated from *E. hyalipennis* by the presence of acrostichal bristles on thorax. *E. albinervis* has pale halteres, whilst in *E. vitripennis* these are blackish.

Empis (Coptophlebia) hyalipennis Fallén, 1816

Ab: Lohja, Karjalohja, Vihti. *N*: Helsinki, Porvoo. *Ta*: Forssa, Hausjärvi, Padasjoki. *Sa*: Joutseno. *Tb*: Keuru. *Sb*: Tuovilanlahti. *Vib*: Valkjärvi (now Mičurinskoe), Uusikirkko (now Poljany), Terijoki (now Zelenogorsk). — Altogether 28 specimens (13 ♂♂ and 15 ♀♀) on dates ranging from 15 July to 13 August.

Tends to be distributed in central parts of Fennoscandia, rare in the south (only 1 pair known from Denmark). North approximately to 68°N, in Norway to *TRi*, in Sweden to *Ly.Lpm* and *Nb*. East Fennoscandian distribution in Fig. 10. A typical summer species, in Fennoscandia mainly at the end of July and in August, on dates ranging from 15 July to 15 September. Throughout Europe but everywhere rather rare.

3. Key to the Finnish species of *Empis* (*Empis*) and *E. (Coptophlebia)*

The following key for the identification is very simplified and will, hopefully, enable easy identification of the species even by those not well

acquainted with the Empididae. The key includes only the species occurring in Finland (and also *E. aestiva*); a complete key to all northern European species will be presented in the 3rd empidid volume of the 'Fauna Entomologica Scandinavica'.

1. Vein M_1 abbreviated, not reaching the wing-margin. Acrostichal bristles absent. Halteres and abdominal pubescence pale. Female hind femora pennate *E. (Copt.) hyalipennis*
- Vein M_1 complete, reaching the wing-margin. Acrostichal bristles present 2
2. Halteres black. Small species, body 2.5–3.5 mm long 3
- Halteres pale; if darkened (*pennipes*), then large species, body about 4–5 mm long, with very long proboscis 5
3. Abdominal pubescence whitish, anal vein complete. Female hind legs rather fringed, no distinct pennation 4
- Abdominal pubescence black, anal vein incomplete. Female posterior four femora and hind tibiae long pennate. Shining black species *E. (E.) aestiva*
4. Humeri and notopleural depression with minute white hairs besides black bristles, mtpl (metapleural) bristles exclusively pale. Mesonotum greyish dusted. Female hind femora evenly dilated, short pennate posteroventrally on apical half *E. (E.) chioptera*
- Humeri and notopleural depression with exclusively black hairs, mtpl bristles black. Mesonotum rather shining black. Female hind femora distinctly convex above, ventrally straight and almost bare *E. (E.) prodromus*
5. Eyes touching on frons – males 6
- Eyes separated by frons – females 12
6. Labrum very long, about 3 times as long as head is high. Halteres rather brownish, or very darkened. Abdominal pubescence and mtpl bristles black. Aedeagus very long and slender. Large species, about 4–5 mm long *E. (E.) pennipes*
- Labrum shorter, at most twice as long as head is high (labium longer if prorect). Halteres pale. Abdominal pubescence pale, at least at base of abdomen 7
7. 8th tergum with a distinct tubercle on each side. 7th tergum with corresponding excisions on hind margin. Dorsum of abdomen dulled by greyish dust. Medium sized species, 3–4 mm long (*E. nigripes*-complex) ..8
- 8th tergum simple, without tubercles, and no corresponding excisions on 7th tergum 10
8. Aedeagus short and stout, distinctly broadened at tip. Mtpl fan usually composed of black and pale bristles 9
- Aedeagus short, stout at base but very slender on apical half, not widening at tip. Mtpl fan composed mainly of pale bristles (often blackish in northern populations). Tubercle on 8th tergum 2-pointed, the tips pointing forwards and backwards *E. (E.) bicuspidata*

9. 8th tergum with a simple round tubercle on each side. Mtpl bristles black, mixed with pale bristles. Mesonotum with 3 indefinite darker stripes on the lines of bristles *E. (E.) nigripes*
 — 8th tergum with a flattened, spoon-shaped tubercle pointing backwards. Mtpl bristles exclusively black. Mesonotum with two rather indistinct darker stripes between the lines of bristles *E. (E.) laminata*
10. Aedeagus short and very stout. Subshining black, robust species, body about 4–5 mm long. Dorsocentral bristles irregularly 2- to 3-serial *E. (E.) syrovatkai*
 — Aedeagus long and slender. Rather densely grey dusted species with acrostichals and dorsocentrals regularly biserial 11
11. Larger, body about 4–5 mm long, 4–6 scutellar bristles. Aedeagus conspicuously long and thin, threadlike, with 3 loops at base *E. (E.) acinerea*
 — Smaller, body less than 3.5 mm long, 2 scutellar bristles. Aedeagus evenly bowed, not conspicuously long *E. (E.) staegeri*
12. Legs not pennate, covered with ordinary hairs and bristles only; no flattened hairs 13
 — Legs distinctly pennate, or at least hind legs with flattened hairs 14
13. Larger, generally over 4 mm. Wings deep brown. Hind femora rather slender, narrowly conical, as deep as hind tibiae *E. (E.) acinerea*
 — Smaller, body 3–4 mm long. Wings clear. Hind femora laterally compressed, twice as deep as hind tibiae, dorsal hairs with a tendency to be flattened *E. (E.) laminata*
14. Labrum very long, about 3 times as long as head is high, halteres with a tendency to be brownish or even darkened. Abdominal pubescence and mtpl bristles black. Legs broadly pennate on posterior four femora and tibiae, shorter flattened hairs on fore tibiae and anterior four metatarsi dorsally. Large species, 4–5 mm long *E. (E.) pennipes*
 — Labrum shorter, at most twice as long as head is high, halteres pale. Abdominal pubescence pale, at least at base of abdomen 15
15. Fore legs with only ordinary hairs or bristles, no pennation or flattened hairs. Abdomen dulled by greyish dust 16
 — Fore tibiae on apical half and fore metatarsi with flattened hairs dorsally. Posterior four femora and tibiae broadly pennate. Large species, about 4–5 mm long, with extensively shining black abdomen *E. (E.) syrovatkai*
16. 2 scutellar bristles. Generally smaller, less than 3.5 mm long, mesonotum uniformly rather light grey. Posterior four femora and hind tibiae almost uniformly distinctly pennate. Abdominal pubescence pale .. *E. (E.) staegeri*
 — 4 scutellar bristles. Generally larger species, body 3–4 mm long, mesonotum with 3 indefinite darker stripes on the lines of bristles. Posterior four legs rather fringed than pennate. Abdominal pubescence with additional black hairs 17
17. Dorsum of abdomen with numerous black hairs, mtpl bristles black and pale. Hind tibiae covered dorsally with predominantly flattened hairs, mixed with additional long simple bristles *E. (E.) nigripes*
 — Dorsum of abdomen covered with predominantly pale hairs, mtpl bristles mostly pale (blackish in northern populations). Hind tibiae dorsally more uniformly short pennate, often with additional longer flattened bristly hairs *E. (E.) bicuspidata*

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