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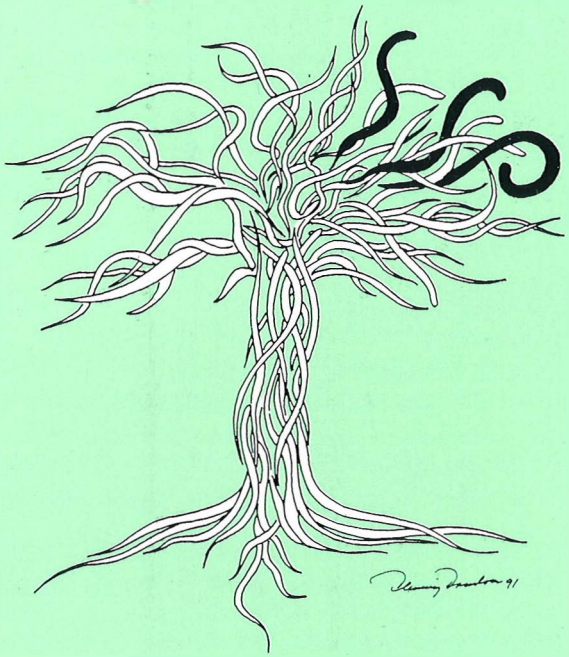

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BULLETIN OF THE SCANDINAVIAN SOCIETY FOR PARASITOLGY

The Bulletin is a membership journal of the Scandinavian Society for Parasitology. Besides membership information, it also presents articles on all aspects of parasitology, with priority given to contributors from the Nordic countries and other members of the Society. It will include review articles, short articles/communications. Comments on any topic within the field of parasitology may be presented as Letters to the Editor. The Bulletin is also open for a short presentation of new projects. All contributions should be written in English. Review articles are commissioned by the editor, however, suggestions for reviews are welcomed.

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Cover: In Norse mythology, the giant ash tree - Yggdrasill - spreads its limbs over the entire mankind. The ash has three roots, each of them sucking water from its own spring.
The first spring- Hvergelmir - is found in the ice cold North; next to the spring, the serpent Níðhoggr is ceaselessly gnawing at the roots of the ash. The second spring - Mímisbrunnr - is the source of wisdom and is guarded by Mímir. The third spring - Urðarbrunnr - is guarded by three women, the Norns, which mete out man's thread of life.

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FIRST OBSERVATIONS OF *PSEUDODACTYLOGYRUS* SPP. AND OTHER PARASITES IN WILD EEL (*ANGUILLA ANGUILLA* L.) IN NORWAY

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Abstract

Thirteen European eel, *Anguilla anguilla*, from Årungen lake and Glomma river, south-eastern Norway were examined for parasites. The at least 12 parasite species recovered included: one kinetoplastid, one (two?) myxosporeans, two monogeneans, three digeneans, one cestode, two nematodes and one copepod. *Pseudodactylogyrus anguillae* and *P. bini* and four other parasite species are reported from Norway for the first time while eel is a new host record for additional 5 species in Norway.

Introduction

Several parasitic species, originally occurring in Asian eel, *Anguilla japonica*, have recently been introduced to European eel, *A. anguilla*, with live imports (Køie, 1987, 1991). These includes the monogeneans *Pseudodactylogyrus anguillae, P. bini* and the nematode *Anguillicola crassus*. Since the introduction, these parasites have been spread to a large number of European countries. *Pseudodactylogyrus anguillae* has been a plague in Norwegian eel farms (Mo *et al*, 1988) while *A. crassus* has been found in a few farmed eel (Mo & Steien, 1994). Other well known parasitic diseases in eel farms are trichodinosis and ichthyophthiriosis. However, with few exceptions, the parasite fauna in wild Norwegian eels is largely unknown.

The aim of the present study was to examine eels in freshwater for the presence of parasites, with special focus on the mentioned exotic species.

Materials and methods

The European eels were caught by eel traps and transported live to the laboratory where they were examined for parasites after decapitation. In September 1996, three eel were caught in Årungen lake, and examined later the same day. In July 1997, thirteen eel from Glomma river were examined. The eels had been

Table 1. List of parasites found in eel *Anguilla anguilla* from Årungen lake and Glomma river

No.inf.= number infected, Int.=intensity range, +=present but intensity not calculated. Abbreviations: m=metacercariae, l=larvae, B=blood, EL=eye lens, GF=gill filaments, GB=gall bladder, I=intestine, UB=urinary bladder

Locality, date	Årungen, 26.09.96			Glomma, 16.07.97 above Sarpsfossen			Glomma, 16.07.97 below Sarpsfossen		
No. examined:	3			5			8		
Length range (mm):	580-690			510-630			425-485		
Weight range (g):	226-570			184-425			108-162		
Parasite species:	No.inf.	Int.	Site	No.inf.	Int.	Site	No.inf.	Int.	Site
Trypanosoma granulosum Leveran & Mesnil, 1909	3	+	B	3	+	B	0		
Myxidium giardi Cépède, 1906	2	+	GF	3	+	GF	8	+	GF, I
Myxozoa (unidentified)*	0			1	+	GB,UB	0		
Pseudodactylogyrus anguillae (Yin & Sproston, 1948)	3	4-16	GF	5	4-7	GF	0		
Pseudodactylogyrus bini (Kikuchi, 1929)	0			5	2-5	GF	0		
Diplostomum sp. (m)	1	13	EL	0			0		
Azygia lucii (Müller, 1776)	1	1	GF	0			0		
Deropristis inflata (Molin, 1859)	0			0			2	1	
Triaenophorus nodulosus (Pallas, 1781)	3	2-10	I	0			0		
Bothriocephalus sp.	3	4-20	I	4	3-15	I	3	3-15	I
Paraquimperia tenerrima (Linstow, 1878)	2	1-15	I	1	2	I	1	1	I
Camallanus lacustris (Zoega, 1776)	1	2	I	5	1-22	I	1	1	I
Ergasilus sieboldi Nordmann, 1832	0			1	4	GF	0		

*possibly pseudoplasmodia of *Chloromyxum*, they appeared similar in UB and GB

caught a few days earlier and kept alive in keep-nets at the sampling locality until transportation to the laboratory. Five eel were caught upstream Sarpsfossen water fall while eight eel were caught downstream. Årungen is located close to the sea and drains into the inner part of the Oslo Fjord while Glomma drains into the outer part of the Oslo Fjord. Glomma from Sarpsfossen is partly included in the tidal zone.

Parasites were identified to genus or species following Buchmann *et al* (1987), Bykhovskaya-Pavlovskaya (1962), Lom & Dykhova (1992), and Moravec (1994).

Results and discussion

The results from the studies of eels from the two localities are presented in Table 1 and discussed below.

This is the first observation of *Pseudodactylogyrus* spp. in wild Norwegian eel. *Pseudodactylogyrus anguillae* was found on the gills of eel from Årungen while both *P. anguillae* and *P. bini* were found on the gills of eel above Sarpsfossen (but not below) in Glomma. The introduction route for the two monogenean species to Norway is unknown. Import of live eel has been banned for several years. However, except from a possible illegal import of live eel, there are especially two possible explanations for the introduction of *Pseudodactylogyrus* spp.: 1. Danish well-boats for live eel transport regularly come to the Norwegian coast. The lower part of the Glomma including its estuary, is one of the main areas for eel catches in Norway and the well-boats often start loading of eels here. These boats are also used for transport of eel along the Danish coast, and both *P. anguillae* and *P. bini* are present in Danish eel (Buchmann *et al,* 1987; Køie, 1988). Even if the well-boats are empty (of eels) when they arrive to Norway, the well may have been contaminated with eggs from the two monogenean species. The egg may have been released with water exchange during transport, and the oncomiracidia infected wild eel; 2. Introduction of *Pseudodactylogyrus* spp. to Norway could have been by is migration of infected eel along the coast from Sweden. According to Buchmann *et al.* (1992), *P. anguillae* and *P. bini* can survive more than 24 hours in 20 ‰ salinity while only *P. anguillae* survived 30 ‰ salinity for the same period. In a study of eel from 7 Danish localities, Køie (1988) found *P. anguillae* in localities with salinity up to 20 ‰ while *P. bini* was found in a freshwater lake only, indicating that *P. bini* has a much lower salinity tolerance than *P. anguillae.* Dr. K. Buchmann (pers. comm., 1998) confirms that only *P. anguillae* (and not *P. bini*) is present in eels along the Danish west coast. If *P. bini* does not tolerate salinity above 30 ‰ for even short periods, a spread of this parasite with migrating eel from Sweden is less likely. However, migration of infected eel from Sweden can explain the occurrence of *P. anguillae* on eel in Glomma and Årungen.

Nine parasite species were found in eels from Årungen while 9 and 5 species were recorded in eel caught upstream and downstream Sarpsfossen, respectively, in Glomma. The only recorded protist, *Trypanosoma granulosum*, was observed in both the lake and river, but in Glomma, only above Sarpsfossen (see below). The two specimens of the marine fluke

Deropristis inflata found in two eels below the Sarpsfossen represent the first record of this parasite in Norway. Two nematode species were present in all three localities and eel is added to the host list for the generalist *Camallanus lacustris* in Norway, while the eel specific nematode *Paraquimperia tenerrima* has not previously been reported from Norway. The most abundant species, *Myxidium giardi*, was present in 75 % of the fish. This species has previously been observed in farmed eel in Norway (pers. obs.) but has never been reported from wild eel.

In Glomma, the three ectoparasitic species *P. anguillae, P. bini* and *E. sieboldi*, and *T. granulosum*, which is dependent of an ectoparasitic leech for transmission, were found in eel caught above Sarpsfossen water fall but not in eel caught below the fall. The reason for this difference may have been due to differences in water chemistry. A large sulphate pulp mill that produces paper, wood pulp and other chemical substances is sited near the water fall. This may have changed the water chemistry below the fall.

Among the 12 species of parasites found in this study, *Trypanosoma granulosum, Myxidium giardi, Pseudodactylogyrus anguillae, P. bini, Deropristis inflata* and *Paraquimperia tenerrima* are new records for wild eel in Norway, while *Azygia lucii, Diplostomum* sp., Triaenophorus nodulosus, Camallanus lacustris and *Ergasilus sieboldi* are reported from Norwegian eel for the first time. In addition, *Bothriocephalus* sp. found in eel in both the lake and river is most likely *B. claviceps* (Goeze, 1782) which is not previously reported from Norway.

Acknowledgements

We thank Morten Ask for sampling the fish in Årungen.

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PARASITES OF GRAYLING (*THYMALLUS THYMALLUS*) FROM THE GLOMMA RIVER SYSTEM, SOUTH-EASTERN NORWAY

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Abstract

Grayling (*Thymallus thymallus*) caught in Glomma river and its tributary Rena in south-eastern Norway were examined for parasites. Thirteen parasite species were found: *Apiosoma* sp. *Epistylis* sp. *Trichodina* sp. *Spironucleus barkhanus, Gyrodactylus thymalli, Tetraonchus borealis, Diplostomum* sp., *Crepidostomum farionis, C. metoecus, Phyllodistomum folium, Cyatocephalus truncatus, Cucullanus truttae, Salmincola thymalli.* One species is a new record for Norway and 5 are new host records in Norway.

Introduction

During the last 7-8 years the parasite fauna of freshwater fish has been studied by the fish parasitology group at the National Veterinary Institute and the Norwegian Veterinary College in Oslo. Most fish have been caught by hook and line, and kept alive until examination. This is a prerequisite for the detection of most ectoparasitic protozoans and metazoans, but it also increases the probability of detecting of endoparasites, especially protists. So far, 12 freshwater fish species have been examined (Appleby & Sterud, 1996a, b, 1997; Sterud & Appleby, 1996, 1997, Mo & Sterud, 1998), and more than 100 parasite species have been recorded. These species represent both new records for Norway (about 50) and new host records (about 40).

This paper presents the results from a survey of the parasite fauna of grayling caught in the Glomma river system.

Materials and methods

Sixteen grayling were caught in July 1990 by drift net and fly-fishing in the tributary Rena, 3-400 m before it drains into Glomma at Rena municipality, located about 140 km north of Oslo. Fifteen grayling were caught in September 1996 by fly-fishing in Glomma about 9 km upstream Rena

Table 1. Parasite species recorded from grayling *Thymallus thymallus* caught in the rivers Glomma and Rena

No. inf.= number infected, Int.=intensity range, -=not studied, +=present but intensity not calculated, >=more than. Abbreviations: m=metacercariee, E=eye, F=fins, GF=gill filaments, GB=gall bladder, I=intestine, PC=pyloric cecae, S=skin, UB=urinary bladder

River, date	Rena, 02.07.90			Glomma, 29.09.96		
No. examined:	16			15		
Length range (mm):	255-390			200-405		
Weight range (g):	138-585			54-433		
Parasite species:	No. inf.	Int.	Site	No. inf.	Int.	Site
Apiosoma sp.	-			1	+	S
Epistylis sp.	-			2	+	S
Trichodina sp.	-			3	+	S
Spironucleus barkhanus Sterud, Mo & Poppe, 1997	16	+	GB	14	+	GB
Gyrodactylus thymalli Zitnan, 1960	3	1	F	3	1-4	F
Tetraonchus borealis (Olsson, 1893)	8	2-41	GF	11	2-24	GF
Diplostomum sp. (m)	-			14	1-10	E
Crepidostomum farionis (O.F. Müller, 1780)	9	1->5	I	3	1-3	I
C. metoecus (Braun, 1900)	8	1->10	I	6	1-7	I
Phyllodistomum folium (Olfers, 1816)	-			7	1-3	UB
Cyatocephalus truncatus (Pallas, 1781)	1	1	PC	0		
Cucullanus truttae Fabricius, 1794	2	1-2	I	4	6-10	I
Salmincola thymalli (Kessler, 1868)	10	1-5	GF	6	1-5	GF

municipality. Both rivers are slow flowing with no waterfalls in the area, and fish can move freely between the two sampling locations.

The fish were transported to the laboratory where they were kept alive in one tank with dechlorinated tapwater until examination within three days of capture. The fish were killed by a blow to the head. Total length and weight were determined for all hosts. Parasites were found by examination of external and internal organs by the aid of a dissection microscope and a light microscope equipped with phase contrast. In most cases, the number of each parasite species was determined, and is presented as intensity range in Table 1.

Parasites were identified to genus or species following Bychovsakya-Pavlovskaya *et al.* (1964) and Moravec (1994). Other references used for species identification are mentioned below.

Results and discussion

The results are presented in Table 1 and discussed below:

Three ciliate species were found on the skin of a few grayling in Glomma. All three species were present in low to moderate numbers in skin scrapings. Based on live observations they were identified to genus-level. These are the first records of ciliates on the skin of grayling in Norway.

In all fish, but the smallest one, *Spironucleus barkhanus* Sterud, Mo and Poppe, 1997 was present in thousands in the gall bladder. In spite of the large numbers, no pathological changes were observed, neither in SEM nor in histologial sections of gall bladders. The locality in the present study is the type locality for *S. barkhanus*, recently described from grayling and Atlantic salmon (Sterud *et al.*, 1997). When this parasite was observed in the gall bladder of grayling in Rena river in 1990, it was tentatively identified as *Hexamita salmonis* based on light microscopy. However, the outbreak of systemic hexamitosis in Atlantic salmon in Northern Norway (Mo & Poppe, 1990; Poppe & Mo, 1992; Poppe *et al.*, 1992) induced detailed studies of the causative organism. Electron microscopic studies revealed that the flagellated organism in both salmon and grayling belonged to a new species, *S. barkhanus* (Sterud *et al.*, 1997). This study further concluded that these hexamitids can not be identified to species- or even genus-level based on light microscopy studies alone (Sterud *et al.*, 1997). Later, hexamitids have been found in salmonids in several localities in Norway, and so far, only *S. barkhanus* has been recorded (Sterud, unpublished). The presence of *H. salmonis* in Norway is therefore disputed.

The *Gyrodactylus* species found in low numbers on a few grayling were identified as *G. thymalli* Zitnan, 1960. This is the first published record of this parasite in Norway, but as seen in Table 1, its presence has been known since 1990. The sclerites in the opisthaptor of *G. thymalli* are morphologically very similar to the phenotypic variant of *G. salaris* Malmberg, 1957 on rainbow trout *Oncorhynchus mykiss* (Walbaum, 1792) (Mo, 1991b) and the differences between them are smaller than the total variation observed in *G. salaris* (Mo, 1991a, b, c).

Furthermore, studies of the DNA from *G. thymalli* from grayling and *G. salaris* from Atlantic salmon have not revealed differences between the two species so far (Cunningham *et al.*, 1995; Cunningham, 1997). Thus, the taxonomic position of *G. thymalli* is at the moment uncertain.

Tetraonchus borealis (Monogenea) and *Salmincola thymalli* (Copepoda) were commonly found on the gills of the grayling in both localities. Both parasites caused gill irritation and damage. *T. borealis* caused gill irritation at the site of opisthaptor attachment, resulting in hypertrophy and hyperplasia of the gill epithelium, and for some *T. borealis* specimens the opisthaptor was completely surrounded by host epithelium. The larger *S. thymalli* causes a more significant damage to the host gills. Firstly, the parasite is anchored to a gill filament with a bulbus which destroys the outer part of the filament. Secondly, the parasite eats pieces of neighbouring gill filaments; this feeding activity often reduces the length of the filament by one third.

The four trematodes found in grayling were all quite common (the eyes and urinary bladder were not examined in fish from Rena) and this is the first published record of these species in Norwegian grayling. Most common were the two *Crepidostomum* species.

Nybelin (1926) recorded *Phylodistomum simile* Nybelin, 1926 and *P. megalorchis* Nybelin, 1926 from grayling in Sweden, Bykhovskaya-Pavlovskaya *et al.* (1962) reported *P. simile*, *P. megalorchis* and *P. folium* (Olfers, 1816) from grayling in the former USSR while Bakke (1985) reported *P. umblae* (Fabricius, 1780) from grayling in different localities in Norway. The specimens in the present study seem identical to *P. folium* found in ruffe, *Gymnocephalus cernuus* (L.) in Glomma (Appleby & Sterud, 1996a). However, as there are several unsolved taxonomical problems related to this and other species in the genus *Phyllodistomum* (see Bakke & Zdarska, 1985), this identification must be regarded as tentative.

The nematode *Cucullanus truttae* was found in the intestine of the grayling. In Norway this species has previously only been recorded in trout from two separate localities in southern parts of the country (Berland 1970, Berland 1990). The present finding therefore represents the first record of grayling as a host for this nematode in Norway, and indicates a wider distribution than previously known.

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SOCIETY NEWS

Members are encouraged to submit items of news, information on forthcoming meetings, personell etc for publication in the News section. Letters and points of view are also welcome.

FROM THE TREASURER

Dear member of the Scandinavian Society for Parasitology

Is time to pay fee for your membership to Scandinavian Society for Parasitology. Regretfully, it has been some time since the last reminder and consequently, many members have not paid fee for several years. The board has decided that members who have not paid for several years should pay for the last three previous years (1995, 1996, 1997). The fee is 150 Swedish Kronor (SEK) per year (75 SEK/year for students). In addition you should pay for 1998, and to reduce costs, you may also pay for 1999.

At the general assembly at Bornholm in 1997 it was decided that SSP should have a local treasurer in each Scandinavian country. In the period 1997-1999, these are Maria Vang Johansen in Denmark, Riitta Rahkonen in Finland, Karl Skirnisson in Iceland, Ingela Krantz in Sweden and Tor Atle Mo in Norway. Each Scandinavian member should receive information from the local treasurer and pay to the local country postal account.

Members outside Scandinavia should receive a letter from the SSP treasurer. These members should pay their fee to the postal account (Postbanken International) 08143937489. The address is Nordisk Forening for Parasitologi c/o Tor Atle Mo, National Veterinary Institute, POB 8156 Dep, 0033 Oslo, Norway. For Swift transfer, the Swift address is PGINNOKK 0814 3937489.
NOTE: Transfer costs should be paid by the member. Thus, transfer costs must be added to the membership fee.

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IN MEMORIAM

Professor emeritus Elias Bengtsson † 1998

One of the founding fathers of the Scandinavian Society for Parasitology, and Honorary Member of the SSP since 1983, died early this year. Birgitta Evengård, Chairman of Svensk Förening för Tropikmedicin wrote this obituary for Tropiknytt, but we would like to present it here as well:

Elias Bengtsson, Sollentuna, professor emeritus blev 79 år. Han föddes i Gränna, son till Gustaf Bengtsson och dennes maka Lydia; hans närmaste är barnen Lars Johan, Stellan och Anne Charlotte med familjer.

Vissa människor åldras inte. Den kroppsliga kostymen skrynklas visserligen, men hos vissa tilltar snarare intellektuell och emotionell kapacitet med åren. Tillägnande av ständigt nytillkommen kunskap och ökande erfarenhet håller blicken ung och hjärtat varmt. Till denna skara hörde Elias Bengtsson, professor i infektionssjukdomar vid Karolinska Institutet när denna institution låg på Roslagstulls sjukhus. Han var också under många år klinikchef och en period blockchef vid nordöstra sjukvårdsområdet i Stockholm.

Elias började sin läkarbana som barnläkare men kom att skriva sin avhandling om infektioners påverkan på hjärtat och sysslade därmed mycket med klinisk fysiologi. De första åren innebar en stor jourbörda. Elias lyckades ändå hålla en stor vetenskaplig produktion och etablerade en fast position inom infektionsläkarkåren. I 40-årsåldern for han med hustru Margareta som var laboratoriesköterska till London för att sätta sig på skolbänken igen under åtta månader. Han hade insett att området tropikmedicin var eftersatt i Sverige. Hemkomna startade Elias och Margareta ett parasitologiskt laboratorium på Roslagstull. Så småningom blev det en tropikmedicinsk avdelning och undervisning för kandidater, blivande infektionsläkare och intresserade kollegor från hela Norden. Vidare bildades Nordisk Förening för Parasitologi och Tropikläkarklubben som numera heter Svensk Förening för Tropikmedicin och är en delförening i Svenska Läkaresällskapet.

Sällan har så många fått så mycken kunskap från en man! Det är få forunnat att introducera och organisera ett nytt ämne som Elias gjorde.

Hans uppväxt i ett kristet hem och hans egna kristna livssyn gjorde att han kände extra mycket för den första vågen av patienter inom tropikmedicinen-missionärerna. Men han tog lika intresserat om hand 60-talets resande revolutionärer och 70-talets luffande hippies. Han deltog i FN-styrka i Kongo och såg ständigt möjligheter att utöka kunskap genom sammanställande av fynd. Yngre kollegor manades till forskning och stimulerades till undervisning.

En öppen attityd, ett noggrant lyssnande och ett omsorgsfullt val av ord var karakteristiskt för Elias personlighet. Efter pensionen ägnade han sig åt politik och deltagande i den allmänna debatten om aktuella händelser. Han odlade sina litterära och

musikaliska intressen. Han spelade tidigare gärna och väl på den vackra orgel han hade i sitt hem vid Edsviken. Och han talade med sorg och vemod om hur han tyckte familjen fått för lite av hans tid. Efter hustrun Margaretas frånfälle kom barnen att betyda alltmer och Elias nämnde dem ofta i olika sammanhang med ömhet och stor kärlek.

Elias Bengtsson var sjuk en tid. Han visade sig under den kris det innebär att ha en svår sjukdom som en förebild i hur en sådan situation kan hanteras och han har nu fått somna in.

Vi ärar en kraftfull. och unik läkargärning och en betydande undervisnings- och forskningsinsats. Och vi tackar för djup och innerlig vänskap.

Birgitta Evengård

ordf Svensk Förening för Tropikmedicin

ANNOUNCEMENT

First announcement has been sent separately to all members, but we remind you of the

19th Symposium of the Scandinavian Society for Parasitology
Reykjavik, Iceland
May 8-11th, 1997

Time and location: The 19th SSP Symposium will be arranged at Grand Hotel, Reykjavík, Iceland during May 8-11th, 1999. This is the first time in the 32 years' history of the SSP that Iceland is the host country.

A local organizing committee (LOC) was established in June 1997. It consists of three parasitologists working at the Institute for Experimental Pathology, Keldur:

Sigurður H. Richter (Keldur, University of Iceland)
Karl Skírnisson (Keldur, University of Iceland)
Matthías Eydal (Keldur, University of Iceland)

A scientific organizing committee (SOC) was established in January 1998. It consists of representatives from all the Nordic countries:

Karl Skírnisson (Keldur, Reykjavík, University of Iceland), chairman
Jouni Taskinen (University of Jyväskylä, Finland)
Flemming Frandsen (Royal Veterinary and Agric. University, Copenhagen, Denmark)
Arne Skorping (University of Tromsø, Norway)
Lars-Åke Nilsson (Dept. of Clin. Immunology, Göteborg, Sweden).

The congress organizing bureau "Iceland Incentives Inc", Hamraborg 1-3, IS-200 Kópavogur, Iceland (Tel. +354 554 1400, Fax +354 554 1472, Email: incentiv@itn.is) takes care of all individual bookings and hotel reservations.

Preliminary planning. On May 8, 1999 (Saturday) a registration and a "Get together" takes place. Scientific program is sceduled on May 9th (Sunday) and until lunch time on May 10th (Monday). In the afternoon an excursion to Gullfoss and Geysir is planned. In the evening the symposium dinner takes place. On May 11th (Tuesday) the scientific program continues until 16:00, when the General Assembly of the SSP is sceduled.

Scientific program. Invited speakers will give lectures on themes which are considered to be of general interest for the SSP members. Some of the lecturers come from the Nordic countries but authorities from abroad are also invited. Participants are encouraged to present contributions in a short lecture and/or with a poster.

The LOC has already made a preliminary time schedule which includes up to 6 invited lectures (each of 45 min, including discussion), 102 submitted oral presentations (each 15 min including discussion) and 60 poster presentations which will be shown during the symposium and discussed in a separate 90 min poster session.

Social program. As already mentioned the LOC will organize a "Get-together" for all participants and an optional half day excursion to Gullfoss and Geysir as well as a conference dinner. Post conference tours and a program for accompanying persons can be organized upon request by Icelandic tourist bureaus.

Announcements and deadlines. All members of the SSP will recieve two announcements from the local organizing committee. Due to the publication of the abstracts in the SSP Bulletin, which will be handed out to the participants at the symposium, the early deadlines for the submission of abstracts and final registration have to be sceduled for December 31, 1998.

Bull Scand Soc Parasitol 1998; 8 (1): 16-30

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