On Microsporon Sapporense

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In Japan, Dohi & Asahi initiated the research on fungi of ringworm in 1900. Since then to the present data, there has been the discovery of M. ferrugineum Ōta and many other studies. We intend to establish a new fact by which we hope to make additional contributions to these studies. We have discovered a new epidemic; the first of it's kind in Japan caused by a microsporum of "origine animale". Our purpose here is to make a report on our observations on this new fungus and its ravages.

We took up our studies of ringworm in Hokkaido in the summer of 1948, and it was not long before we found a strange colony on Plaut's media. It has appeared frequently since the time of the discovery on other agars, used in our experiments. There are no previous reports of the said growth in any mass-research conducted in Japan prior to this date.

The characteristics of the said fungus on infected hairs are obviously that of the microsporum, rapid in growth on agar, with a tendency to change into early pleomorphism and with spindle shaped macroconidies appearing always and in large numbers under the microscope.

The following report is based on clinical researches of our ambulatory patients and examinations of school children groups in five regions of Hokkaido.

Epidemic

Since Takahashi[1] conducted his research on ringworm in Sapporo in 1928, no other researches of its kind have followed. Our present research is the second of its kind and is more extensive, covering all Hokkaido. As previously mentioned we have discovered an unusual fungus appearing frequently on our agars. At the present moment we prefer to classify the said fungus as M. Sapporense, named by S. Takahashi[2] who accidentally obtained only one culture in 1934, clinically.

We began our research upon the discovery of the said fungus from our ambulatory patients. We

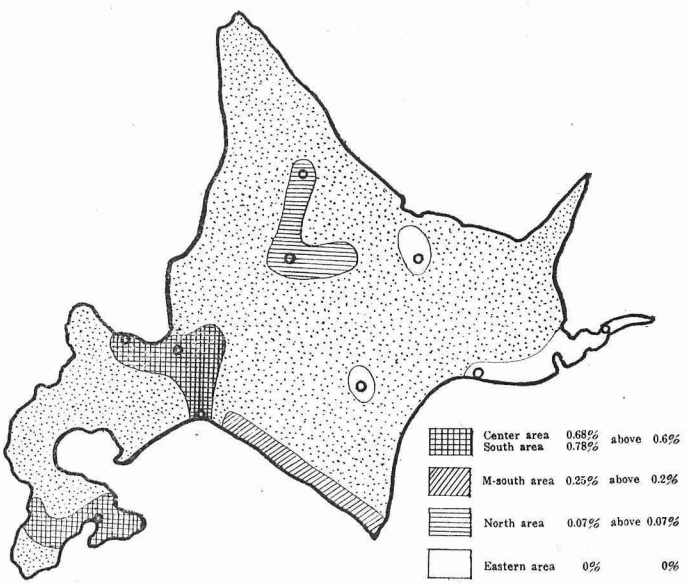


Fig. 1 The geographical distribution of M. Sapporense in Hokkaido.

1) Takahashi, S: Japan. Zeitschr. f. Dermat. u. Urol. 28, 582 (1928).
2) Takahashi, S: Japan. Zeitschr. f. Dermat. u. Urol. 36, 261 (1934).

then turned our attention to primary school children. Results are as shown in following tables. Ambulatory results appear in table 3 and 4 and the results in the five regions are shown in table 1 & 2 and Figure 1.

Table 1 *Diseased children by M. Sapporense*

Region in Hokkaido	All investigated children	Cats with localized alopecia	Ringworm due to M. Sapp.
Center area	14265	76/187	97 (0.68%)
M-south. area	6003	14/69	15 (0.25%)
South. area	762	4/21	6 (0.78%)
North area	7686	7/31	6 (0.07%)
Eastern area	2975	5/13	0 (0.00)
	31691	106/321	124 (0.38%)

Table 2 *Frequency of M. Sapporese in 5 areas in Hokkaido*

Region in Hokk.	Sex	6	7	8	9	10	11	12	13	14	15	
Center area	♂		9	23	20	10	7	8	3			80
	♀		2	8	3	2	1	1				17
M-south area	♂	2			4		7					13
	♀	1		1								2
South area	♂		4	1				1				6
	♀											
North area	♂	1	4			1						6
	♀											
Eastern area	♂											
	♀											
	♂	3	17	24	24	11	9	3				105
	♀	1	2	9	3	2	1					19

Table 3 *Ambulatory patients*

Patients with ringworm	Ringworm due to M. Sappor.	Clinical forms		
		T. capitis	T. corporis	T. pedis
309	33 (10.6%) ♂ 14 ♀ 19	11 (8, 3)	19 (5, 14)	3 (1, 2)

Table 4 *Ages and sex of patients, suffering from M. Sapp.*

Years	1–6	6–10	11–15	16–30	31–50	total
♂	8	6	0	0	2	16
♀	7 (15)	3 (9)	2 (2)	5 (5)	0 (2)	17

We have investigated 31,691 primary school children and 309 patients with ringworm to this data, and have obtained 157 cultures of the said fungus. The affected percentage by this fungus is 0.39% among children of primary schools, except in the case of other fungi.

Eight year olds show the highest percentage. With this as the summit of the parabola the curve slants downward on both sides. The higher the school grades, the lower the disease. However the said fungus is not entirely incapable of attacking adults as indicated in our ambulatory results, appearing in the form of Tinea corporis.

The statistics on house-cats kept by patients are exceedingly interesting as shown in table 1. According to the statements of children, upon our questioning, we have discovered that out of 321 cats 106 have disease spots.

The ratio of healthy cats to infected is in direct proportion with the degree of ravage due to the said fungus in each location.

We have actually been able to cultivate the same fungus from the infected hairs of these cats.

Taking another example, four girl students from the same dormitory with the disease have infected their pet cats.

According to this evidence, we have been able to suspect the existence of an epidemic due to the said fungus, not only among people, but also among cats.

If the fungus is identical to that of Takahashi's discovery in 1934, we venture to say that it is a point worthy of interest, as a period of 15 years has elapsed since Takahashi.

Culture

In our field test, we used large mouthed short length test tubes (2.0×10) with cork stoppers. After sterilizing, the test tubes were placed in a portable case with a grip handle so as to make transportation a lesser problem, especially during long field trips.

In cultivating, we obtained good results by simply soaking material in Ether for 30–60 seconds, absorbing Ether by using sterilized filter paper, and cultivating same without further processing on Plaut's media.

Other procedures were experimental.

1) *Direct examination*

Under a microscope the infected hairs show an irregular collection of small ($3\,\mu$) round spores forming a "mosaic" or "stonewall collection", surrounding the hair in a sheath. At times hyphae may even be observed in the hair itself. Also a decomposition of tissue may be frequently observed on the broken stumps of hairs. Moreover at times the so-called tranged Adamson appears on the stumps. In the scraped skin of the diseased area, segmented and branched mycelium elements and spores are found here and there.

2) *Primary culture*

On Plaut's media after 48 hours, the planted material forms a swollen white tubercular mound.

After 4 days, the mound becomes conspicuous. A greyish wool like, mycelium appears, part of which grows upwards, with the remainder creeping along the surface and radiating. The radiations appear as a straight line and are more apparent in micro culture. The colony takes on a silken sheen under certain light conditions. As stated later a coloration of the base, can be observed at this stage.

After 8 days, the colony has grown to a size of 1.3 cm to 2.0 cm in diametre, at times even reaching to the walls of the test tubes. Some of the centre nodules do not grow and others grow to a hemispherical white mound, some of them sink and form a depression. The mycelium radiating from the centre nodules creep forward in long and scattered lines, a few shallow furrows radiating from the centre appear without reaching the fringes of the growth, at times there are none and also infrequently there are more than a few. It is notable that on the underside of the colony, a coloration can be seen. The nodular centre has a yellowish orange tint, which becomes lighter, changing from deep yellow to a lemon yellow as it approaches the fringe. The fact that this coloration is not due to mycelium is proved by observing a slide of a section of a culture bed

(with colony); the bed itself is colored.

After 14 days, the colony has grown beyond the media and has climbed the tube walls, coming to a length of 2.5 cm. to 3 cm. and in macroculture spreads to approximately 6 cm. The center zone surrounding the nodules, which is covered with short wooly mycelium, takes on a powdery appearance. The next zone appears as a scattered growth with long grey wooly mycelium. The outer fringe of which being similar to that of a sheared edge of a woolen cloth. The coloration on the reverse side has increased in density. The hyphae seldom penetrates the media.

After 20 days; The growth is still continuing. The white wooly mycelium completely covers the surface. However in macroculture the center zone may still be seen. The constructive elements of the above centre and fringing zones differ mycologically. (vegetative forms and reproductive forms)[3]

After 30 days; The growth has reached its later stages. In many cases, at this stage, preomorphismus commences to show.

After 60 days; preomorphisums has become localized. They appear as white long wooly hemi-spherical mounds which have a tendency to frequent the center zone. The growth has completly stopped and both media and colonies are drying up. The color has changed to a dark brown.

3) *Further culture*

Results of transplanting, in Sabouraud's glucose agar, are similar to that of the primary culture. However it is noticeable that the coloration recedes and it is observed that at times, even in secondary cultures, hardly any coloration shows. Further transplantings tend to cut off colorations, also proportionally speaking the area of the center zone gradually exceeds that of the fringing zone. The results of milieu de conservation is inferior to that of Sabouraud's media. The colonies are thinner and mycelium is sparse with the coloration darker; showing a light chocolate brown. In the said media, transplantings have failed to produce pleomorphismus.

4) *Other media*

Results using Plaut, Sabouraud (glucose & maltose), and Pollaci mediae are almost the same. Using potato, the results are not quite satisfactory as the above. After 1 week the growth which is of a white color was measured at 1.5 cm in diametre.

By placing material in glucose Bouillon it grows to a cotton like ball approximately 1 cm in diametre. After two weeks the ball appears on the surface and floats.

5) *Fluorescency.*

Under Wood's filter, infected hairs and cultured materials are fluorescent. The fluolescency varies with the freshness of the material, the older it is, the less light it exudes.

Infected hair: brilliant white violet.

Nodular part: purplish white of a lesser degree of light.

Center zone: white scattered light pin points appearing against a back ground of light dun color.

Fringing zone: A faint purplish white glow is present against a grayish brown back ground.

The outermost zone: Light cream yellow (fairly discernable).

Mycology

In the case of micro culture on the second data, outbursting segmented hyphae of comparatively large sizes (3–5) were showing in the immediate vicinity of the transplanted material.

On the 3rd day the hyphae growth has extended substantially with branches spreading.

The branches appear in the vicinity of the segment joints, above and below. The branches have a tendency to run parallel with the stem. Even in this stage some of the terminal ends of the segments take on a swollen appearance and become the so-called raquet-shaped hyphae. In most

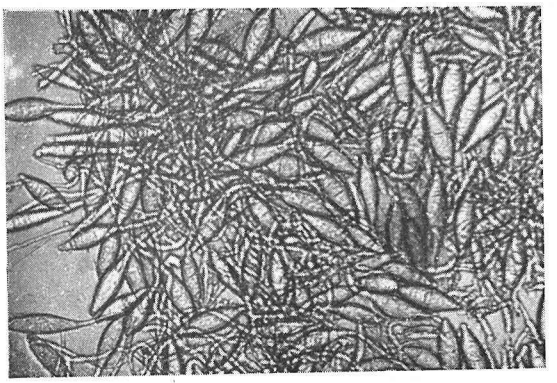
3) Lewis & Hopper: an Introduction to medical Mycology (1948).

cases around the 5th day spindle-shaped macroconidis make their appearance. It is in this stage that the presence of the center zone becomes apparent and in which the majority of the above fuseaux appears. Fuseaux appears at the beginning in the form of branches from the stem. As it grows, it takes on a spindle shape. Later, partitions form, dividing the Fuseaux into several sections. Finally, the Fuseaux sheds and separates itself from the hyphae. Though the shapes vary, the ends form a blunt point. Wart like minute lumps appear on the surface but there are none in the earlier stages. There are some differences in the sizes and they have a tendency to appear more densely towards the ends. The cells formed by the partitions in the Fuseaux become discernable in a few days and in which are contained protoplasma of a light green color with numerous granules, at times the protoplasma appears in a ribbon like form down the centre. In many cases a sprout appears at the end, or at times, others appear from the main body. The number of cells range from several to 15 Sizes of Fuseaux; width 10–15, length 20–75.

Besides, from around the 5th–7th days, ectospores are born on the sides of certain stems. Also at times similar to the above, many short branches, protruding in the same direction in the form of comb teeth, which are believed to be "organe péctine" quoting Takahashi, as "organe péctine" quoting Takatsuki, and at places there are formations of "organe pèctine", we would venture to say that this formation may be observed, though infrequently. We would also say that it resembles that of combs rather than Sabouraud group (Ota) comb, in shape. At times Thorn-like mycelium, are formed branching out from various points in irregular wheel spoke formation and rarely, independent tufts appear, which have an entwined appearauce. Thus forming an organe nodulaire. They belong to Ota's Sabouraud type. Also rarer still, antler, type branchings have been observed, which resemble root of tree. Chlamidospores gradually make their appearance around the time of the forming of the center zone in the culture. There are both C. terminale & C. intercalaire types and are products of the later stage. Spiral shaped organs were not to be seen. About the time the culture withered, Fuseaux and Alwurie scattered among the remnants of the withered stems. The appearance of these organs diminish, as the number of culture generations increase and organe nodulaire completely disappear. Results are same using Bouillon media.

Fig. 2

1. les fuseaux
   a. a good many fuseaux, which are raked off by platinum *ear*, from the center zone of culture.
   b. macroconidia, in bearing on a branch.
   c. macroconidia, in branching from body.
2. la hyphe sprifere simple
   a. microconidia, along the side of hypha, sessile oron on short sterigmata.
   b. aleuries (Ota), hypha has already dried up.
3. le mycelium en raquette
4. chlamidospres
   a. ch. inter calaire.
   b. ch. terminale
   c. spores myceliennes
5. l'organe pectine
6. l'organe nodulaire
   a. sessile form, young body.
   b. developed large body.
   c. nodular body on sterigma.



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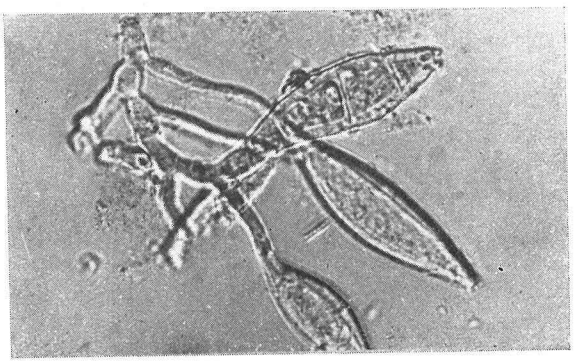

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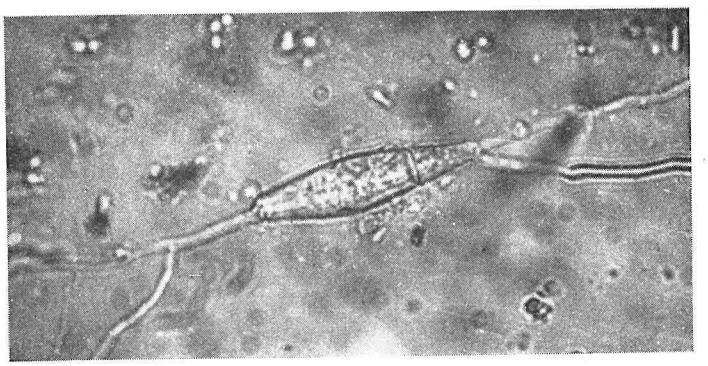

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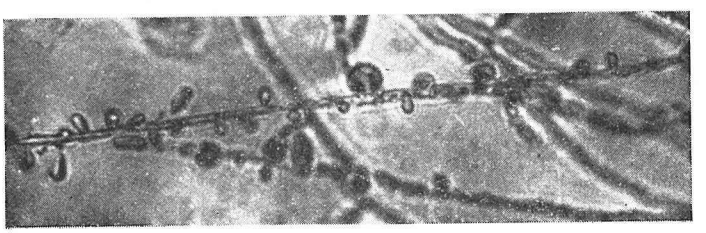

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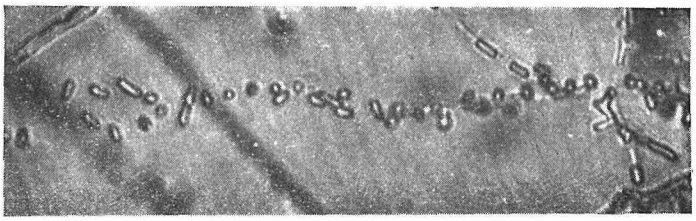

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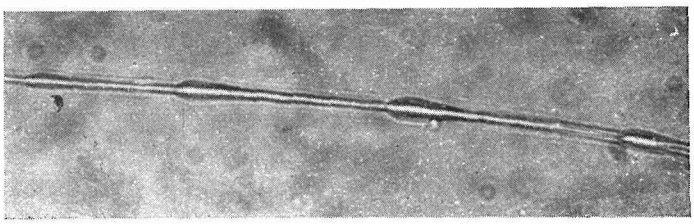

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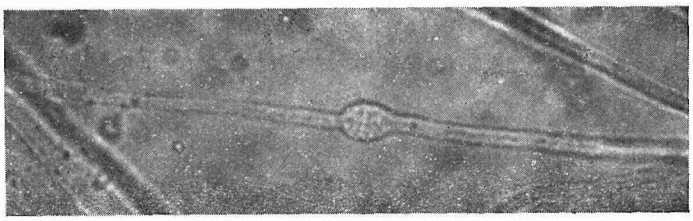

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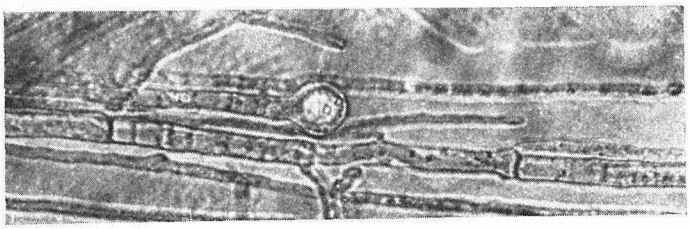

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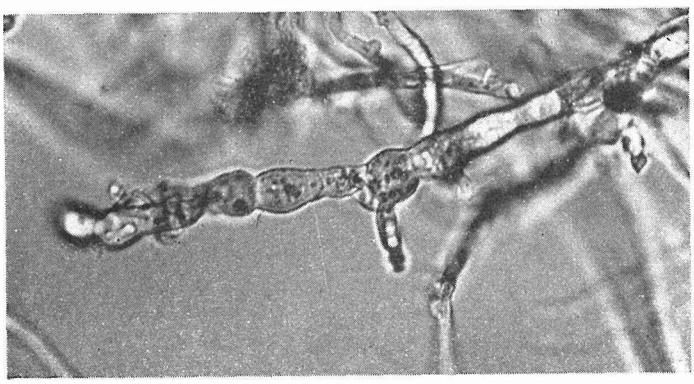

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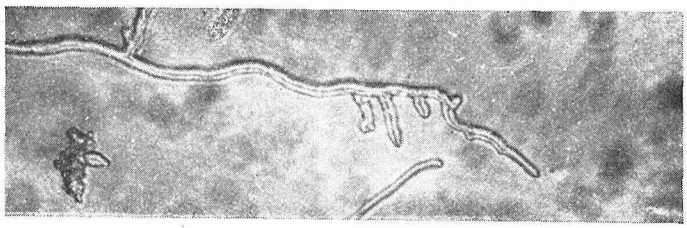

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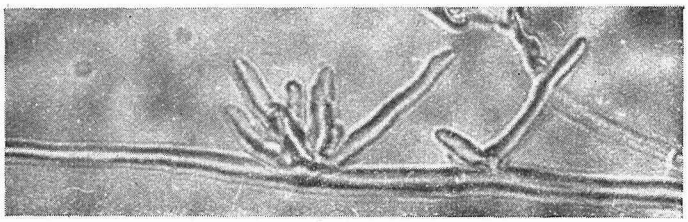

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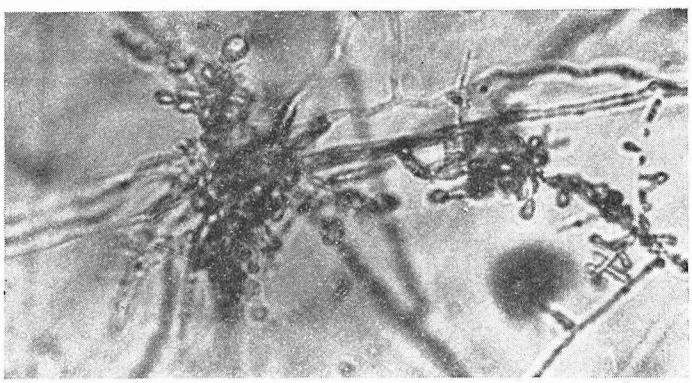

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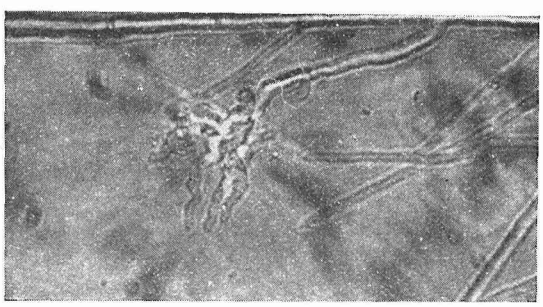

6. c.

Inoculation on animals

In the case of an adult person, we scraped the forarm, in two places about 1 cm in diametre, and inoculated one with Fungi emulsion and the other with Penicillium notatum, as a control. The later showed but a temporary reaction. However the former showed an intense hyperemia on which numerous vesicules appeared, and the infected area increased. Whereas the control reactions disappeared in 4–5 days.

In the case of cats, after shearing a part of the hair off the back, we rubbed in Fungi emulsion with sand paper. After 3 days, localized inflammation appear and after 7 days hairs commence to shed. After observing these hairs under a microscope, spore sheaths can be seen occasionally on the roots, as in the case of diseased cats.

By replanting the said hairs we have obtained positive results. It is possible to inoculate guinea-pigs and rabbits. Reaction in the former are distinct.

Determination of species

Summarizing the results of our above findings and taking into consideration the following facts:

The condition of the spores forming on the hairs coincides with that of microsporum. It prospers in test agar, pleomorphismus appears early. Mycologically, speaking spindles appear in vast number. Animal inoculation is easy. The same fungi are found on diseased cats. There is no doubt that the fungi we are cultivating is identical to animal parasitical microsporum.

Origine animaux. For instance we can consider M. lanosum, M. felineum, M. fulvum, M. equinum, Tr. rosaceum, Tr. cerebriforme, Tr. equinum, which however do not coincide in either culture form or mycological findings. We find only two that we are able to pick out as resembling species, out of past reports, which resemble the species reported by Takahashi and the species reported by Takatsuki. Both authors have based their reports on one single case alone, and have both determined and discussed accordingly. Takatsuki[4], later than Takahashi, made his report in 1936 from a single specinum obtained in Saghalein. Quoting his points quote, "both are microsporum. He reports that the origin is Hokkaido and is a Tinea corporis, whereas I say Saghalein, Tinea capitis. Our findings using agar are approximately the same, also mycologically the birth of spindles and its form and the formation of organe nodulaire etc. point out the similarity of both. Both show positive on animal transplanting. Hunting for differences, my colony, in the first generation forms as a concentric circle, also looking at mycological elements there are simple ectspores and comb-form organs. However he does not report these points," unquote. In the later part of his report Takahashi says that he believes both Sapporo and Saghalein stubs are the same. Comparing both of the reports, we, too, have reason to believe that they more than probably were. Comparing our fungus with theirs, we find that, clinically, culturally, and mycologically, and in animal inoculation, there is but little difference. Looking at these slight differences, hardly anything can be said except in the coloration of primary culture, Takatsuki's concentric circle. Tassel like growth in culture fringe and comb-organs and very little at that. The colloration of the primary stage following the transplanting of the material is according to Takatsuki and Takahashi, greenish yellow and yollowish white, whereas in our case the majority showed a slightly greyish white. It could be attributed to a difference of expression.

In regard to Takatsuki's concentric circle in the primary growth, we, too, have frequently observed the appearance of concentric circles which appear with the varying of conditions, (especially temperature). We seldom noted the tassel like growths as were reported by both authors in their

4) Takatsuki: Japanische Zeitschrift f. Dermat. u. Urol. 40, 4 (1936).

fringing zone. However when the culture is placed in a 26°C incubator, hyphae in general, show such a rapid and abundant growth that a mixture of thick and thin parts do appear. However we have yet to observe conditions as shown in photo studies by Takahashi and Takatsuki. Though both authors report the presence of radiating furrows, there are cases in which none appear, or to be exact, there are more cases without, than with.

Mycologically, both authors discuss the presence and absence of comb-form organs and simple ectspore. We have found the ectspore. As we stated before, we have also seen an irregular comb-like formation of short branchings which we would say, resembles Achorion group comb rather than Sabouraudites. Our impression is that our comb, our thorn-like hyphae, and our nodular orgrn, are of a similar biological nature.

As we have stated above, in spite of the slight differences as noted, the characteristics as seen in our observations, conform with that of the two authors. We will not attempt to nominate a new species. As we obtained our first stub, at the beginning of our investigation, in Sapporo, and as Takahashi had proceeded Takatsuki, we have decided to adopt Microsporon Sapporence, or Sabouraudites Sapporensis, as named by Takahashi.

Further more, as Takahashi discovered his fungus from bare skin parts in the macrovesicular form and as Takatsuki discovered his fungus from Tinea capitis, we are led to think of the difference between the two stubs. However in our epidemic, both types were common and we can not believe that these indicate a difference of noteworthiness.

Symptomatology

1) *Tinea capitis (Trichophytia superficialis capillitii)*

According to our observations the form as Tinea capitis are prevailent. The greatest number of infected areas are found on the temporal area with occipital, frontal, parietal area and whole head area following in order. It is not the same as in the case of Microsporon japonicum in which the most infected area is the parietal area. The size of infected areas seldom exceeds that of an infants hand. The most common of types are; several finger-nail sized spots appearing in scattered formation, rather close together. One egg size area surrounded by dotlike scattered satelites, and the whole head area scattered over by infected spots the approximate size of a finger-nail. In short, in the case of Microsporon Sapporense the infected areas are of smaller dimensions as compared with that of Microsporon japonicum and are seldom to be found fuzed together, showing as large map-like areas as in the case of Microsporon japonicum. The borders of the infected areas are

Table 5 *Clinical forms on children*

Regions in H.	Patients due to M. Sapp.	Clinical forms			
		T. cap.	T. prof.	T. corp.	T. facialis
Center area	97 ♂ 88 / ♀ 9	77 / 7	2 / 1	4	5 / 1
M-south. area	15 ♂ 13 / ♀ 2	12 / 1		1 / 1	
South area	6 ♂ 6 / ♀ 0	5			1
North area	6 ♂ 6 / ♀ 0	4		1	1
Eastern area	0				
	124 ♂ 113 / ♀ 11	98 / 8	2 / 1	6 / 1	7 / 1

clear cut, and the areas are covered with round white or grey bran-like pityroid squamous lesions and there are hardly any inflammatory or subjective symptoms. The infected hairs become lusterless, brittle and break off easily. The loss of hair becomes apparent. In other words contrary to the report of Sabouraud, the appearance of Tinea capitis by Microsporon Sapporense resembles that of Tinea capitis by Microsporun rather than Microsporon japonicum which is also a Microsporun.

2) *Tricophytia profunda (Kelion celsi)*

There are 2 types. The first appearing as a secondary stage form Tinea capitis and the second as an acute inflammatory symptom. In Japan there are approximately 100 cases (of symptoms) derived from cultivation of pathogene from the said symptoms. The main *causal* fungus being, Microsporon japonicum, Trichophyton violaceum, Trichophyton gypseum. We have proved the presence of Microsporon Sapporense in 3 cases out of 4 and 1 case of Microsporon japonicum. As a symptom, a tumor of semispherical appearance, ranging from the size of a pigeon's egg to a hen's egg, appears. The presence of fluctation and a dull pain is significant. Hairs can be plucked readily and with the appliance of pressure, pus oozes forth. In the cases advanced form Tinea capitis there are instances in which, simultaneously, white squama mottles may be observed. In other words there are no significant appearances, characteristic of Microsporon Sapporense.

3) *Trichopytia facialis (Dohi)*

The late prof. Dohi[5] named this form due to the fact that fungi can be proved in the squama. However in Europe and America this name is not in use and this form is generally considered as pityriasis or Eczema. Sabourauds reports the said form as an ailment caused by streptococcus. Jadassohn also prefers to record it as Pityriasis simplex or Pityriasis facialis.

There is a Sabouraud's report about small (pale) epidermis lesions, with brown center and five squamous margin in corporal area. But these lesion were temporary and no fungus was found in these lesions, also his observations do not coincide with ours of Trichophytia facials. There are also no reports concerning this form in American Literature and even in the reports concerning Tinea corporis. We have been unable to find reports resembling ours. Thus we are led to believe by clinical reports of Trichophytia facialis, that it could possibly be a special form to be found thriving within Far East Asia, alone.

Contrary to Dohi's report, the culture from squama is extremely difficult. Thus some authors in this field have doubted his theory. From 1906 to 1941 only 11 positive cases have been reported (Yamada, Ōta[6], Terai[7], Morikawa[8], and Araki[9]). Among the above Terai and Araki succeeded in the culture of the epidermis tissue and Morikawa had, success in squama. The 11 cases, with the exception of 1 case which was a Trichophyton violaceum, were M. japonicum. We succeeded in obtaining 11 positive cases. Our material was squama scraped off with surgical knife to the point of drawing blood from capillary vessels. 8 out 11 were M. Sapporense, 2 were M. japonicum, and the remainning 1 was Tr. gypseum. Hence in our investigations on Hokkaido we report that the main fungus is M. Sapporense.

The fact that this form is scarce in the case of infants in the nursing stage and that it appears frequently in children of school age is that the former is less exposed to infection and the later contracts this form at the same time of the infection of Tinea capitis. Though there is no apparant explanation as to the natural recovery in the age of puberty, it may be attributed to the natural inclination to cleanse facial parts and the lesser probability of contracting disease, together with the completion in development of the 'Säuremantel' of the epidermis as in Araki's report. Due to the fact that positive cases in culture of squama are rare and successful results are obtainable only from

5) K. Dohi: Dermatologie 3 (1630).
6) Ōta: Japan. Zeitschr. f. Dermat. u. Urol. 2, 330 (1921).
7) Terai: Japan. Zeitschr. f. Dermat. u. Urol. 35, 600 (1933).
8) Morikawa: Dōjinkai-Zasshi. 14, 407 (1940).
9) Araki: Japan. Zeitschr. f. Dermat. u. Urol. 50, 13 (1941).

material taken from the deeper layers of the epidermis, it may be assumed that the hyphae, after avoiding the 'Säuremantel' thrives and matures in the deeper parts. Also it may be concluded that the development of the 'Säuremantel' inhibits the growth of the hyphae and at the same time acts as a shield by which the penetration of the hyphae is prevented.

As noted above, though culture of squama remains difficult, as reported by Dohi, in the cases of Tr. facialis of school children, result from deeper parts are obtainable. Thus we believe that Dohi's nomenclature of this form is not objectionable.

According to our observations the infected areas have clearly defined borders, which appear in single or in plural, as white or grayish white mottles covered with rice-bran-like squama. The sizes range from 1 to 5 cm in diametre. At times, a loss of pigment in the infected areas may be seen. There are hardly any inflammations. There are no small papules or vesicles. There is no itching. At times these macules surround eyebrows, also at times the areas straddle forhead parts and haired scalp. There are instances in which eyebrows have thinned out by loss of hairs. In other words there are cases in which bristles and downy hairs are infected simultaneously, in the same infected areas.

4) *Tinea corporis (Trichophytia maculovesiculosa)*

According to our investigations, 25 cases were found to be caused by M. Sapporense. To wit, 2 head cases, 2 facial and 1 forearm. The remainder were situated on the trunk of the body. The borders were clearly definable with both circular and ring forms. The center zone showod a loss of pigment. The fringes were inflamed. Many vesicles papules were observed. In all cases the surfaces were covered with rice-bran-like squama. Also less frequently 2 or 3 rings were present. In the above cases there appears to be no difference as compared with this form caused by other fungus.

5) *Tinea pedis (Tr. pompholiciformis)*

We observed 2 cases on the fingers and palms and only 1 case in the center of the soles, in both cases vesicles and pustules were seen. There were no macerations or sogginess. Itching was strong.

We have not yet discovered other forms, to wit Tinea cruris, Tinea barbae, Tinea unguium, caused by M. Sapporense.

(Receivead Feb. 20 1951)

Summary

We are continuing our investigations on Hokkaido. Up to the present date, we have investigated 31,691 school children and 309 ambulatory patients with ringworm as indicated at the beginning of this report.

During our investigations we have obtained 157 cultures of a new species, which is found all over Hokkaido except in the eastern region. As an interesting result of our research, we have an entirely new set of figures on house cats which indicates the presence of a new epidemic. Parallel to our investigation on school children, we conducted an investigation in regards to their pets. As a result, and by the statements of the school children it has been revealled that the figures of "Cats with localized alopecia" comes to 106/321. We have discovered, as a fact, that on culture beds the material obtained, from a large number of investigated cats, contains the same fungi species. The deseased localities of cats are mainly on the facial parts especially the ear flaps, outer top sides of the eyes lids, and from the forhead to the parietal part. Besides the above, deseased areas may be seen on the outer sides of the forlegs, knees and on the back parts. On the mottled and deseased spots where the bristles have become detatched, a mixture of down like fur and bran-like squama may be observed and at times squamous surface is bared. From these parts, as in the cases of deseased persons, it is possible to pluck deseased hairs with spore-sheaths.

Thus we have discovered evidence of an epidemic among cats by this fungi, and also have been

able to inoculate cats in our laboratory. It is notable that cats are more readily inoculated than any other animals. Moreover, mycologically it has all the qualifications of microsporun d'organe animale. In other words, we have noted that in both children (Adults are also susceptible; note additional report) and cats a close similarity in regards to the findings, also we have proved the presence of the same etiology, and we have reason to suspect the presence of a 3 way exchange, between children, among cats, and between childen and cats.

To this date no reports have been made in Japan concerning a ringworm epidemic from microsporun of animal origin. Previously, in documents a few confined cases have been reported. However such an interesting fact as ours has not been reported.

Pondering the reason we arrive at the conclusion that, with the exception of Takahashi, the said fungi species have not been reported from any other locality or land. More tnan probably this particular species has existed in its present north-most end of Japan and its neighbouring localities, Takatsuki's stub was discovered at Ōdomari, Saghalien. Takahashi's stub, in this original report states "ditch digger in Karifuto," Hokkaido. However according to a statement by Komuro who cultured Takahashi's stub, it was a Korean ditch digger (Doko) called Yamashita. It can easily be imagined that the said laborer had moved from one project to another as is the nature of the "Doko". Thus it would be difficult to pin its origin to Karifuto. However by the date of the disease the locality in which it had been contracted could have been either Hokkaido or Saghalien. At the beginning of the discovery of this epidemic, with the possibility of its emigration from Saghalien in mind, we centered our investigation on Saghalien repatriates. Especially in the case of T. school in Sapporo where half or more of the children are repatriates, we made a concentrated research on repatiate children, comparative percentage between repatriates of infection comparative percentage of presence of said fungi, date of repatriation and date of infection. However we regret to say we were unable to obtain any reasonable data to prove the migration of our species. We must reconsider this later, after the area around Wakkanai and north most points closest to Saghalien have been investigated. We should also include a report in regard to the correlativity with the Ainu (aborigines of Hokkaido) but no data is available. In conclusion we suspect that our species have a parasitifer prior to its attachment to the cat. Also there is a suspiscion that this fungi could possibly have been originated in a certain species of wild animal and by importation to cats relayed to man. However we can not make a judgement on this subject as yet. Though mycologically, our results are more or less the same as that of Takahashi and Takatsuki, we find that the details concerning the said fungi, after our numerous encounters and experiences with it in this epidemic, do not coincide in certain aspects. Especially by the various organs originating in this species, we have data by which we could possibly make statements concerning the nature of nodular organs and comb-like organs. However we prefer to conclude our report by merely classifying Microsporon Sapporense as follows.

Conclusion

1. We have investigated the ringworm of school children, clinically and mycologically, in five areas of Hokkaido. 157 colonies of our collection are colonies due to a new fungus in usually mass research.

2. Assuming that 157 cultures are of the same species, we identify it as Sabouraudites Sapporensis Takahashi.

3. The said fungus culturally and mycologically are of animal origin. Also we have proved an epidemic among cats by this fungus.

4. We have confirmed the epidemic of ringworm by microsporun of animal origin in Japan.

5. And we have mentioned about the clinic of this fungus.