

Sirakasi to Kunugi no Takuwaerareta

Denpun no Kisetu ni yoru Masiheri

SATOO Taisitiroo

TAKEGOSI Takuzi

Taisitiroo SATOO, and Takuzi TAKEGOSI:

Seasonal Change of Starch Content in *Quercus myrsinaefolia*

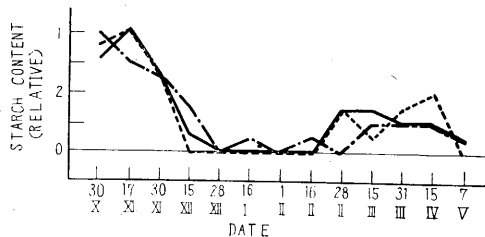
and *Q. acutissima*

Ki no naka ni takuwaerareta denpun ga kisetu to tomoni itizirusiku masiheri suru koto wa hurukukara sirarete ori, kotoni kudamono no ki ni tuite wa yoku siraberarete iru (4, 5) ga, mada hakkiri sinai tokoro mo ari, mata sono ooku wa eda dake ni tuite sirabeta mono de, miki ya ne ni tuitewa kiwamete huzyuubun de aru. Kono masiheri wa ki no syurui ni yotte (6), mata tikai syurui demo sono haete iru basyo ni yotte ikuraka tigau (8) node, sorezoreno syurui ni tuite iroirona toti de sirabete miru hituyoo ga aru to omowareru. Booga de daigawari o suru baai ni sono seiseki wa takuwaerareta mono no ryoo ga kankei site iru to iwarete iru node, sonoyoona hayasi o tukuru ki no uti kara, huyu ni ha no otinai mono to site sirakasi o, ha no otiru syurui to site kunugi o erande, sosiki ni hukumareru denpun no kisetu ni yoru masiheri o sirabete mita.

Sirabekata

Tookyoo-to Tanasi-mati ni aru Daigaku no naehata ni mihon to site uerareta ki kara, 1949 nen 10 gatu 30 niti kara oyoso hantuki gofoni zairyoo o totta. Kunugi wa 1929 nen ni oyoso 15 nen-sei no ki o kitta kirikabu kara booga sita mono de, 21 nen-sei, mune no takasa no tyokkei 18~22 cm, takasa 7~10 m de, konara to mazatte haeteiru. Sirakasi wa misyoo-nae o ueta mono de, 20 nen-sei, mune no takasa no tyokkei 14~19 cm, takasa 5~6 m de atta. Sirabeta bubun wa hosoi ne, hutoi ne, miki (zigiwa kara oyoso 1 m no tokoro), hutoi eda (3~5 nen), hosoi eda (1949 nen ni nobita mono), atarasii eda (1950 nen ni dete kara) de, totte kara *glycelin* to *alcohol* (oyoso 95%) o onazi ryoo mazeta mono ni tukete oita. Kore o *suberi-microtome* de 40 μ no atusa ni yokoni kiri, yoodo-yoodokari eki de den-

pun o somedasite kenbikyoo de sirabeta. Denpun no ryoo o arawasu niwa sosiki ni denpun ga mitite iru toki o 10, mattaku mirarenai toki o 0 to site, 0~10 no kazu de arawasita. Hitotu no seppen ni tuite ± 1 gurai no yomitigai wa ariuru to omou. Sirabeta sosiki wa zu 2 oyobi 3 ni aru toori de, zentai to site no ryoo (zu 4) wa kirikuti ni arawareta sorezore no sosiki no hirosa [no wariai o takusan no seppen ni tuite motome, sore ni yotte omomi o tuketa heikin de simesita. Zairyoo wa sorezore 3-bon no ki kara totta ga, hobo onaziyoo na masiheri o simesita, sono hitotu no rei o zu 1 ni simesu.



Zu 1. Kunugi no hosoi eda no denpun no masiheri no ki ni yoru tigai

(Fig. 1. Individuality in the change of starch content in twigs of *Quercus acutissima*.)

(Syasin 1~8). Zui no naka demo mokubu ni tikai bubun (zuikan) ga mottomo oku denpun o hukumi, heru no ga osoku, arawareru nomo hayakatta.

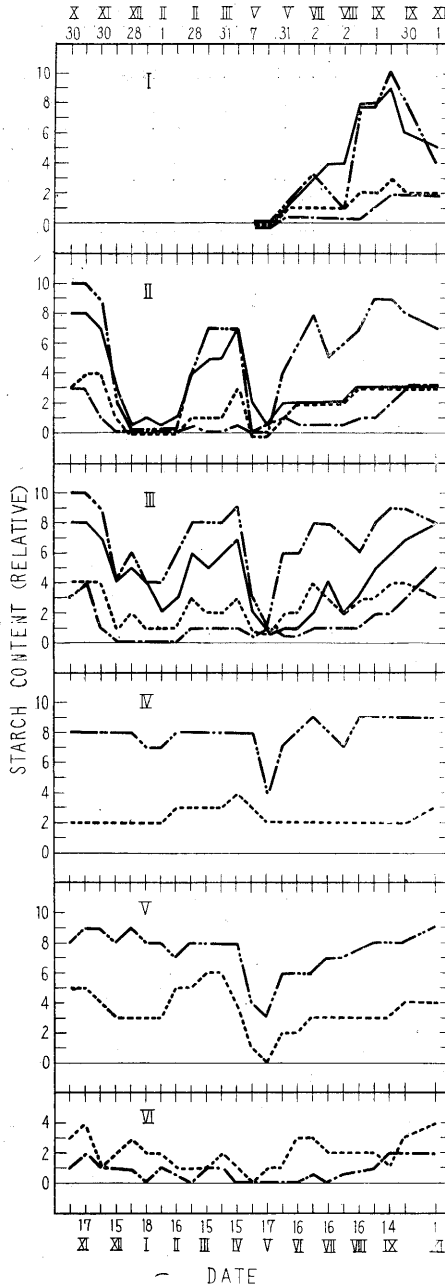
1. Kunugi (zu 2 oyobi 4)

Miki dewa kawari ga sukunaku, haru me o dasu mae no yama to me o dasita ato no tani ga mirareta dake da ga, sonohoka no bubun dewa osoaki no yama to huyu no tani, oyobi haru no yama to tani ga mirareta. Aki no yama no ato no heri wa eda de itizirusiku, ne dewa yuruyaka datta. Haru no hue wa hutoi ne to miki de hayaku, eda dewa osoku, eda deno haru no yama wa aki no yama ni oyo-banakatta. Me ga deru toki no heri wa ne dewa me ga deru sugumae kara hazimatta ga, tuti no ue no bubun dewa me ga deru to tomoni herihazimeta. Me no deta sugu ato niwa, hosoi eda dewa, huyu to onazini mattaku denpun ga mirarezu, hutoi eda demo hotondo nakunatta. Ne to miki demo kono toki ga mottomo suginakatta. Me ga nobita ato no denpun no huekata wa hazime wa ne de mottomo sumiyaka datta. 7 gatu nakagoro kara 9 gatu hazime no aida ni denpun no huekata ga tomattari aruiwa hettari suru no ga mirareta nowa "doyoome" ga nobiru no to hobo toki o onaziku site ita. Sono noti kara huehazime, 10 gatu sue niwa hutatabi yama ni natta. Atarasiku nobita eda dewa 9 gatu ni yama ga mirareta.

Mitakoto

Sirabeta kekka o zu 2~4 ni simesu.

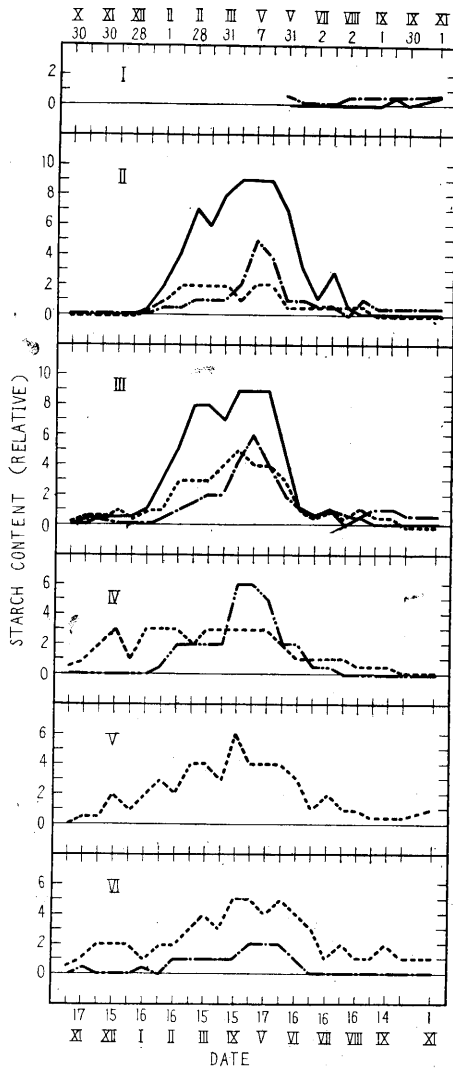
Denpun wa zui, zuisen, mokubu no zyuusaiboo, hibu no zyuusaiboo ni mirare, nakademo zui to zuisen ni mottomo oku mirare, masiheri mo itizirusikasta



Zu 2. Kunugi no sosiki-betu no denpun no masiheri (Fig. 2. Seasonal change of starch content in tissues of *Q. acutissima*.)
 — Zui (Pith) - - - - Zuisen (Ray) - · - · -
 Hibu (Bark) - - - - Mokubu (Wood)
 I : Atarasii eda (New Shoots), II : Hosoi eda (Twigs), III : Hutoi eda (Branches),
 IV : Miki (Trunks), V : Hutoi ne (Roots),
 VI : Hosoi ne (Fine roots).

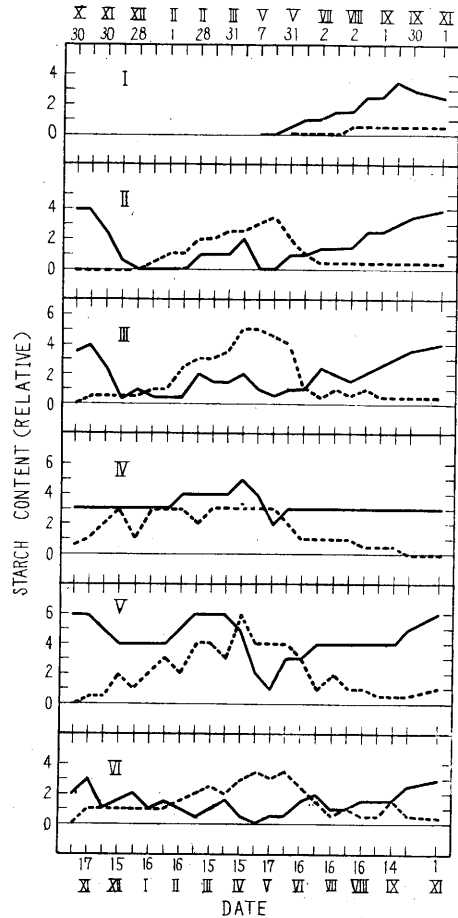
Ha no otiru kooyoozyu dewa denpun no masiheri ni hutatu no yama to hutatu no tani ga aru koto wa hiroku mitomerarete iru ga, reigai ga nai koto mo nai (11). Kunugi demo yahari eda dewa hutatu no yama to hutatu no tani o miru koto ga dekita ga, miki dewa aki no yama to huyu no tani wa hotondo mitomerarenakatta. Ne ni tuite wa huyu ni denpun ga heru to iu hito (7, 9) to heranai to iu hito (6) ga aru ga, kunugi dewa huyu ni heru no o mitometa. Me ga dete sakanni seityoo suru toki niwa denpun wa itizirusiku hetta ga, kore wa seityoo no tameni denpun ga tukawareta to kang aerare, atarasii me no seityoo ga owari, atarasii ha no hikarigoosei ga sakanni naru to denpun ga tamarihazimeru ga, 7 gatu nakagoro kara tamaru no ga tomari, aruiwa heru no ga mirareta. Kono koto wa kudamono no ki demo mitomerarete ori (4, 5), kore wa "doyoome" ga nobiru no to toki o onazikusite iru. Kunugi no seityoo no yama wa 2-kai aru to hookoku sarete iru (1). Aki no denpun no ryoo no yama wa, ne, tuti no ue tomoni ha no iro ga kawaru koro ni okori,

12' gatu ni naru to eda dewa kyuuni denpun ga heri, haru ni tikazuku ni turete denpun wa hutatabi itizirusiku masu ga, huyu no aida niwa hikarigoosei wa okonawarete inai kara, hokano katati de takuwaerarete ita mono kara denpun ni kawatta mono to kangaerarete iru (7). Mata kono ziki ni hosoi ne de hokano bubun ni sakidatte denpun no heri ga mirareru ga, kore wa ne ga ugokihazimeta koto o simesu no daroo.



Zu 3. Sirakasi no sosiki-betu no denpun no masiheri.
(Fig. 3. Seasonal change of starch content in tissues of *Q. myrsinaefolia*.)

Zu 2 no setumei o miyo (see the explanation of Fig. 2)



Zu 4. Sirakasi to kunugi no denpun no masiheri no keikoo.

(Fig. 4. General trend of the change of starch content in *Q. acutissima* and *Q. myrsinaefolia*.)

— Kunugi (*Q. acutissima*)
- - - Sirakasi (*Q. myrsinaefolia*)
I, II,VI—Zu 2 no setumei o miyo
(I, II,VI—see the explanation of Fig. 2)

2. Sirakasi (zu 3 oyobi 4)

Sirakasi dewa kunugi to kotonari, denpun no ryoo no yama wa haru me no nobiru mae ni itido arawareru dake datta. Aki niwa doko nimo denpun wa hotondo mirarezu, 11 gatu ni haitte kara denpun ga araware hazimeru ga, miki to ne dewa hayaku, eda wa okurete 1 gatu ni naranakutewa huenai. Kore ga yuruyaka ni haru me no nobiru mae no yama made tuzuki, yama ni naru nomo miki-ne-eda no zyunzyo de aru. Me ga dete kara no heri wa eda-miki-ne no zyun de, kono zyun ni mattaku denpun ga mirarenaku naru. Sirakasi deno kono herikata wa kunugi deno sore yorimo yuruyakadatta. Me ga nobita ato wa kunugi no yooni hutatabi hueru koto wa naku, aki ni itinen de mottomo sukunai toki ga arawareta.

Ha no otinai kooyoozyu no denpun no masiheri ga ha no otiru mono to kanari tigatte iru koto wa yoku sirarete iru (6, 7 nado) ga, izuremo hutatuno yama to hutatu no tani ga aru koto o nobete iru. ISHIBE wa arakasi dewa haru no yama ga 3 gatu sue, haru no tani ga 5 gatu nakabasugi, aki no yama ga 11 gatu hazime, huyu no tani ga 1 gatu kara 2 gatu no sue da to siteiru. LECLERC DU SABLON wa kagaku-bunseki ni yotte *Quercus Ilex* no wakai ki niwa haru no yama no hokani miki dewa 11 gatu hazime, ne dewa 12 gatu hazime no yama ga aru koto o mite iru ga, sirakasi dewa kono aki no yama ga mitomerarenakatta.

Sirakasi dewa kunugi ni kurabete haru no denpun no herikata ga yuruyaka de, kunugi dewa haru no yama to tani no aida ga tuti no ue no bubun de oyoso 1 tuki, ne de oyoso 1.5 tuki de aru ga, sirakasi dewa tuti no ue no bubun de 1.5~2 tuki, ne dewa oyoso 2.5 tuki de atta. Mata haru no tani no arawareru nowa me no deru ziki no tigai to onaziku, sirakasi no hoo ga kunugi yorimo osokatta.

Booga de daigawari suru hayasi o kiru kisetu ni tuite no ooku no siken (1, 2, 3, 4, 10, 12) wa, komakai ten dewa iroirona kotae o dasite iru ga, seityoo o hazimete kara kiru to ato no booga ga warui to iu koto dewa itti site iru. Kono ziki wa booga no moto ni naru takuwaerareta mono ga tukaihatasareta ato ni atatte iru.

Kono sigoto wa NAKAMURA Kentarô sensei no gosidoo no moto ni okonawareta. Atuku orei o moosiageru.

クヌギとシラカシの貯蔵デンプンの季節による増減 (摘要)

助教授 佐藤大七郎

竹越卓爾

クヌギとシラカシの貯蔵デンプンの季節による増減を顕微化学的にしらべた。クヌギとシラカシでは共に春に芽の出る時に貯蔵デンプンの激減がみられたが、そのほかの点では増減のもようがことなつていた。クヌギでは枝と根では初冬と春の発芽後の2極小とその間の2極大をみとめたが、幹では冬の極小が見られなかつた。シラカシでは冬から発芽直前までの間にデンプンの蓄積がみられたが、芽の出た後の蓄積は冬になるまでみとめられなかつた。春に新芽がのびはじめると貯蔵デンプンが急に減ることは、低木の伐採季節試験に於て春の生長開始後の伐採が萌芽成績を不良にするという事実と一致する。

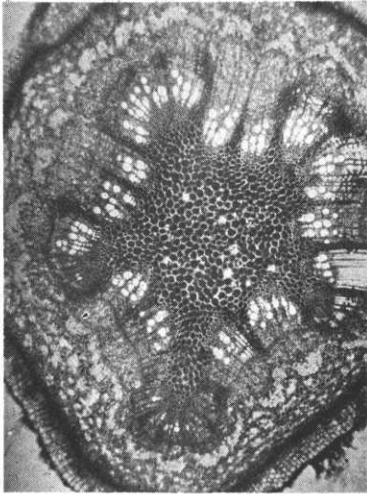
Bunken

1. 明永久次郎 1923, くぬぎの伐採季節と萌芽との關係に就て 林試彙報 21: 1—24.
2. 浅川 林三 1939, 矮木の萌芽に関する研究(第1報) 伐採季節と萌芽との關係 日林誌 21: 350—360
3. 萩原 渡 1941, ハンノキ類更新伐採の適季並適輪に就て 朝鮮林試時報 23: 31—61
4. 福田 照, 黒井 伊作 1949, 落葉果樹(葡萄, 桃, 梨, 柿)の枝梢内に於ける澱粉の季節的消長 園雑 18: 150—154
5. 藤村 次郎, 佐野 利雄 1939, 柿樹に於ける澱粉の季節的变化 園雑 10: 20—26
6. 石部 修 1936, 樹木内貯蔵澱粉及脂肪の季節的变化 生態研 2: 1—6
7. LECLERC DU SABLON 1904, Recherches physiologique sur les matières des reserves des arbres. I. Rev. Gen. Bot. 16: 341—358, 386—401
1906, Recherchee physiologique sur les matieres des reserves des arbres. II. Rev. Gen. Bot. 18: 5—25, 82—96
8. McDUGAL, D T., 1938, Tree growth
9. 三村 英男 1936, 満洲樹種の冬期貯蔵澱粉及脂肪の季節的变化 植動 5: 771—776, 951—956, 1143—1147
1936, 満洲樹種の成長期に於ける貯蔵澱粉及脂肪の季節的变化 植動 5: 1651—1658, 1793—1800
10. 中島 道郎 1931, 矮木の伐採季節と萌芽との關係 東大演報 15
11. NOTTER, F. C., 1903, Die jährlichen Wandlungen der stickstofffreien Reservestoffe. Diss. Heidelberg.
12. 大平 隆 1935, クヌギの伐採適期に就いて朝鮮林試時報 13: 58—72

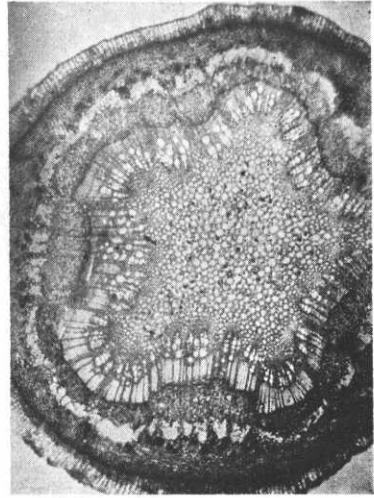
Résumé

Seasonal change of starch content in the tissues of *Quercus myrsinaefolia* BLUME (evergreen) and *Q. acutissima* CARR. (deciduous), both planted in the suburb of Tokyo city, was studied. Samples from fine roots, roots, trunks, branches,

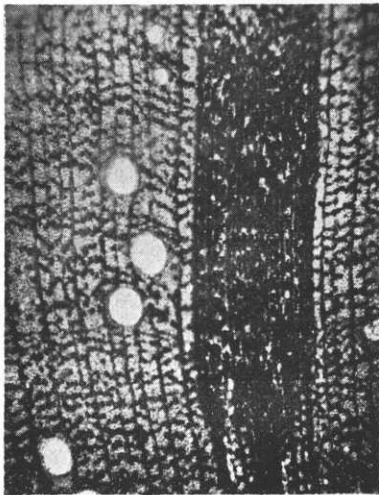
twigs, and new shoots were taken twice a month, sectioned to the thickness of 40μ with microtome, and observed by means of microscope. Starch was found more abundantly in pith and ray, and the change was more remarkable in these tissues. In both species, starch decreased suddenly in the spring after the opening of buds, but there were some differences between the two in other points. In *Q. acutissima* (Fig. 2 and 4), minimum of starch content was observed in the early winter and in the spring in roots and branches, while it was observed only in the spring in trunks. Change in starch content was more remarkable in branches and twigs. Between July and September, starch stopped to increase or decreased in some parts, it coincided with the "lammas growth". In *Q. myrsinaefolia* (Fig. 3 and 4), however, accumulation of starch was observed only before the opening of buds, after that it was not found until winter. The decrease of starch content of *Q. acutissima* in the spring was more sudden as compared with *Q. myrsinaefolia*. The minimum in the spring was observed earlier in *Q. acutissima*, as seen in the opening of buds. Sudden decrease in starch content with the opening of buds agrees with the fact that felling of coppice trees in the growing season results poor sprouting.



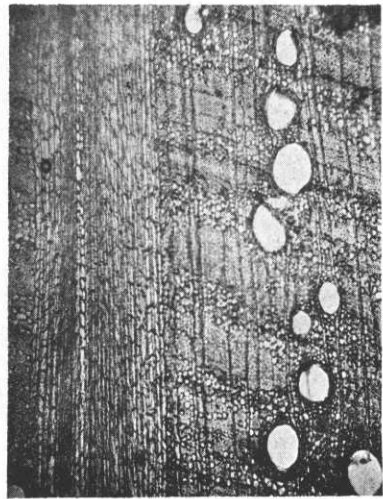
1. Kunugi, hosoi eda, X. 30. (Aki no yama).
 1. *Quercus acutissima*, twig, Oct. 30
 (The maximum in autumn).



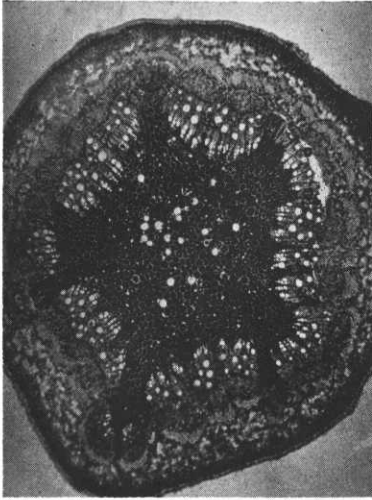
2. Kunugi, hosoi eda, XIII. 38. (Hatuhuyu no tani).
 2. *Quercus acutissima*, twig, Dec. 28. (The minimum in winter).



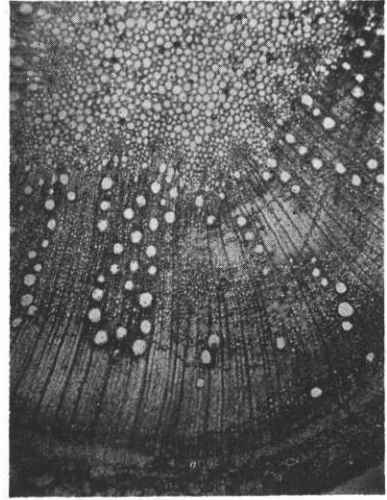
3. Kunugi, hutoi ne, IV. 15. (Me no nobiru mae no yama).
 3. *Quercus acutissima*, root, Apr. 15. (The maximum before the opening of buds).



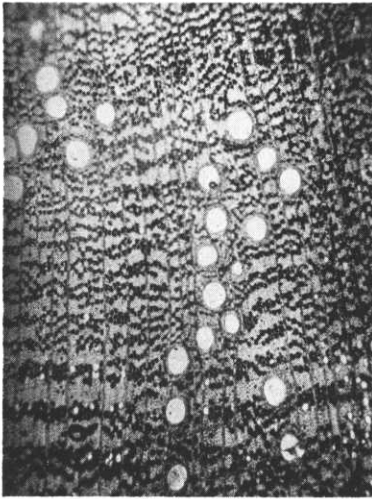
4. Kunugi, hutoi ne, V. 7. (Me no nobita ato no tani).
 4. *Quercus acutissima*, root, May 7. (The minimum after the opening of buds).



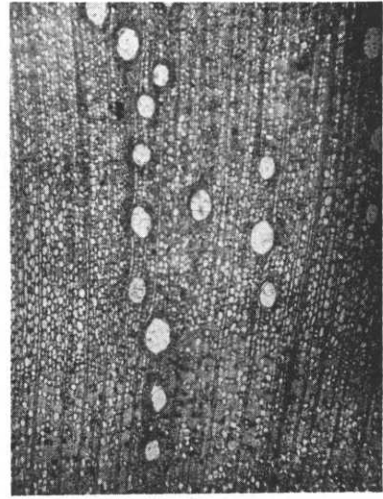
5. Sirakasi, hosoi eda, V. 7. (Me no nobiru mae no yama).
 5. *Quercus myrsinaefolia*, twig, May 7. (The maximum before the opening of buds).



6. Sirakasi, hosoi eda, VII. 2. (Me no nobita ato).
 6. *Quercus myrsinaefolia*, twig, July 2. (After the opening of buds).



7. Sirakasi, hutoi ne, IV. 15. (Me no nodiru mae no yama).
 7. *Quercus myrsinaefolia*, root, Apr 15. (The maximum before the opening of buds).



8. Sirakasi, hutoi ne, IX. 1. (Me no nobita atono denpun no mirarenai ziki).
 8. *Quercus myrsinaefolia*, root, Sept. 1. (After the opening of buds)