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A BIBLIOGRAPHY OF THE ORIENTAL ARMYWORM, *MYTHIMNA SEPARATA* (WALKER)

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INTRODUCTION

The Oriental armyworm, Mythimna (Leucania) (Pseudaletia) separata (Walker) is a noctuid moth whose larval (caterpillar) stage is a serious pest of cereals, pasture and forage crops in Asia and Australasia. Its distribution ranges from Japan to New Zealand, and from Afghanistan to Western Samoa (see Fig. 1). Outbreaks occur sporadically, but yield losses due to the gregarious, later instar caterpillars can be very heavy, sometimes resulting in the destruction of the entire crop. The adult moths are capable of long-range migration, at least in China and Japan. Common names for the pest include: southern armyworm, sorghum armyworm, army caterpillar, ear-cutting caterpillar and paddy cutworm (Sharma and Davies, 1983).

Our aim in producing this bibliography is to up-date the earlier work of Sharma and Davies (1983), which should be referred to for a review of the biology, pest status and control of M. separata. The present bibliography mainly covers references published between 1981 and 1987, with some pre-1980 entries which had not been included by Sharma and Davies. The references included here are mainly those thought to be of use to workers in the fields of ecology and pest management of M. separata . We have not included papers where M. separata was used as the experimental insect for either 'pure' physiological studies or for the bioassay of viruses.

The bibliography is set out as follows: firstly, there is the list of references, arranged in alphabetical order by author. Secondly, there is a subject index referring to each reference by its number, senior author and date; here, as well as the categorisation by main subject area, a brief comment is made on the specific subject of each paper. Finally, there is a host crop index and an index of the localities where the work was undertaken.

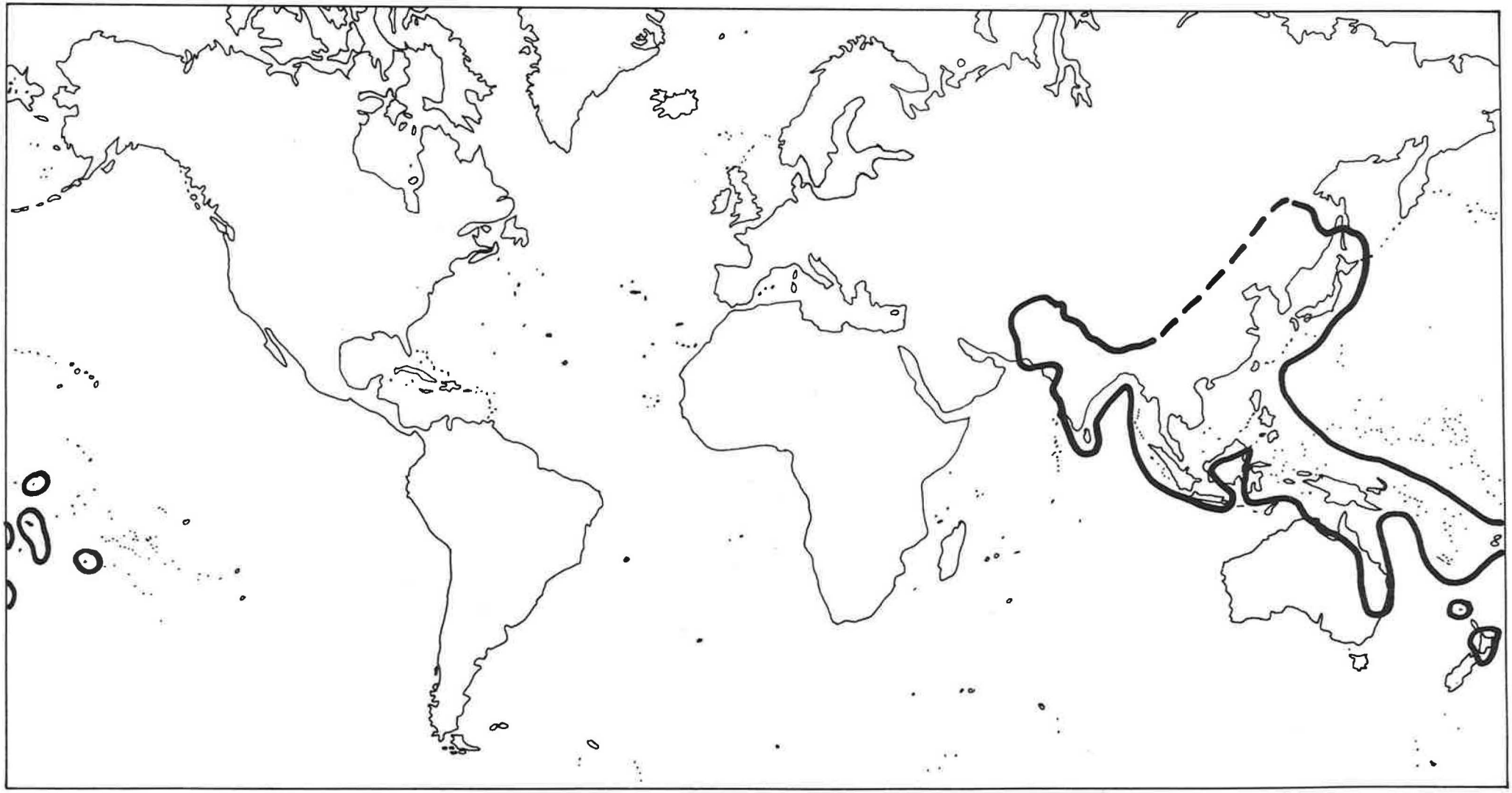
Note on Language Abbreviations

In the alphabetical reference list, the language of the main text is indicated by the abbreviations given below (initial letter in upper case, e.g. Ch).

Where the main text is not in English, the language of an abstract or summary is indicated by an abbreviation with the initial letter in lower case, e.g. en.

En - English
Ja - Japanese
Ru - Russian
Ch - Chinese
Ge - German
Fr - French
Th - Thai

Fig. 1. Distribution map of Oriental armyworm.



Redrawn from Commonwealth Institute of Entomology, Distribution Maps of Pests, Series A (Agricultural), Map No. 230 (revised) (1983).

BIBLIOGRAPHY

1. ATSUHIRO S. (1969). The locomotive activity of Leucania separata larvae in relation to rearing densities (Lepidoptera: Noctuidae). Japanese Journal of Ecology, 19:73-75. Ja,en.

2. BARWAL R.N. (1983). Outbreak of rice ear-cutting caterpillar Mythimna separata (Walker) in Manipur, India. International Rice Research Newsletter, 8:11-12. En.

3. BERGER L.P. (1984). Study of the role of temperature and photoperiod in the development of the meadow moth Leucania separata Walk. (Lepidoptera, Noctuidae). Entomologicheskoe Obozrenie, 63:425-432. Ru,en.

4. BI F.C. (1981). A new artificial diet for the armyworm Leucania separata. Acta Entomologica Sinica, 24:379-383. Ch,en.

5. BI F.C. (1983). Effects of simple artificial diets with antimicrobial agents on the development of armyworm Leucania separata Walker. Insect Knowledge (Kunchong Zhishi), 20:260-263. Ch.

6. BREMPONG-YEBOAH C., SAITO T., MIYATA T. (1983). Injection toxicity of some pyrethroids in the armyworm. Journal of Pesticide Science (Nihon Noyaku Gakkaishi), 8:95-98. En.

7. BREMPONG-YEBOAH C.Y., SAITO T., MIYATA T. (1984). The selective toxicity of some synthetic pyrethroids in the armyworm Pseudaletia separata (Walker). III. Cuticle permeabilities of some pyrethroids. Applied Entomology and Zoology, 19:87-94. En.

8. BREMPONG-YEBOAH C.Y., SAITO T., MIYATA T., TSUBAKI Y. (1982). Topical toxicity of some pyrethroids. Journal of Pesticide Science (Nihon Noyaku Gakkaishi), 7:47-52. En.

9. CATLING H.D. (1980). Deepwater rice in Bangladesh, a survey of its fauna with special reference to insect pests. Bangladesh Rice Research Institute, Overseas Development Administration, Deepwater Rice Pest Management Project Report. London: Overseas Development Administration, ix+100pp. En.

10. CHAO W.Y. (1980). A preliminary study on the sterilisation of the armyworm (Leucania separata Walker (Mythimna separata)) with gamma-rays. Zoological Research, 1(2):269-273. Ch.

11. CHAO W.Y. (1981). The distribution, translocation and function of semen in the female reproductive system of the armyworm moth (Leucania separata Walker). Acta Entomologica Sinica, 24:135-141. Ch,en.

12. CHIN T.-S. (1979). The relations of population dynamics of the armyworm Leucania separata to relative humidity and rainfall. Acta Entomologica Sinica, 22(4):406-412. Ch,en.

13. CHIU S.F. (1984). Recent advances in the integrated control of rice insects in China. Bulletin of the Entomological Society of America, 30(3):41-46. En.

14. CHIU S.F. (1985). Recent research findings on Meliaceae and other promising botanical insecticides in China. Zeitschrift fur Pflanzenkrankheiten und Pflanzenschutz, 92:310-319. En.

15. CHU Y.-I. (1979). Insect pests of corn at Kediri Jawa-Timur, Indonesia. Plant Protection Bulletin, Taiwan, 21:397-402. En.

16. CLEARWATER J.R. (1975). Structure development and evolution of the male pheromone system in some Noctuidae: Lepidoptera. Journal of Morphology, 146:129-175. En.

17. CROMEY M.G., GRBAVAC N., SHERIDAN J.E. (1980). Diseases and pests of cereals in the Wairarapa - a six year study. In: Proceedings of the thirty-third New Zealand weed and pest control conference. Willow Park Motor Hotel, Tauranga, August 12th to 14th, 1980. (Ed. M.J. Hartley) pp. 254-257. Palmerston North, New Zealand: New Zealand Weed and Pest Control Society Inc. En.

18. DASS R., PARSHAD B. (1984). Rearing of important lepidopterous pests on known artificial diet and screening for preferred hosts of the parasite Telenomus remus, Hymenoptera: Scelionidae. Journal of Entomological Research (Delhi), 8:89-92. En.

19. DEOL G.S. (1982). Outbreak of armyworm on wheat in India. Tropical Pest Management, 28:175. En.

20. DEOL G.S., SANDHU G.S., BHALLA J.S. (1981). Efficacy of different insecticides for the control of armyworm Mythimna separata. Indian Journal of Entomology, 43:361-363. En.

21. DESHPANDE R.R., MATKAR S.M. (1983). Chemical control of armyworm, Mythimna separata Walker on maize. Pesticides, 17:19. En.

22. DILAWARI V.K., MAHAL M.S., BAINS S.S. (1981). Role of a braconid parasite and a viral disease in the population decline of armyworm Mythimna separata Noctuidae Lepidoptera during an outbreak. Indian Journal of Ecology, 8:65-73. En.

23. DOUGLAS J.A., KAIN W.M., DYSON C.B.(1981). Effect of time and extent of defoliation on grain yield of maize in relation to cosmopolitan armyworm (Mythimna separata Walker) damage. New Zealand Journal of Agricultural Research, 24:247-250. En.

24. ENTWHISTLE P.F. (1985). Viruses - an alternative answer to insect pest control. NERC News Journal, (Sept. 1985):11-16. En.

25. GOVINDAN R., AWAKNAVAR J.S., THIPPESWAMY C., DEVAIAH M.C. (1981). Incidence of jowar armyworm, Mythimna separata (Lepidoptera: Noctuidae) on maize cobs. Journal of the Bombay Natural History Society, 78:412-413. En.

26. HILL M.G. (1986). Effects of Cotesia ruficrus (Braconidae: Hymenoptera) parasitism and rearing density on Mythimna separata (Noctuidae: Lepidoptera) food consumption, and implications for biological control. New Zealand Journal of Agricultural Research, 29:281-287. En.

27. HILL M.G., ALLAN D.J. (1986). Maize yield response to simulated armyworm (Mythimna separata) defoliation. New Zealand Journal of Agricultural Research, 29:401-405. En.

28. HILL M.G., ATKINS A.W. (1982). Effects of defoliation by cosmopolitan armyworm, Mythimna separata (Walker) on maize yield. New Zealand Journal of Agricultural Research, 25:251-254. En.

29. HILL M.G., ATKINS A.W. (1983). Incidence of the armyworm Mythimna separata Walker (Noctuidae: Lepidoptera) and its introduced parasite Apanteles ruficrus Halliday (Braconidae: Hymenoptera) in maize. New Zealand Journal of Agricultural Research, 26:135-138. En.

30. HILL M.G., HIRAI K. (1986). Adult responses to larval rearing density in Mythimna separata and Mythimna pallens (Lepidoptera: Noctuidae). Applied Entomology and Zoology, 21:191-202. En.

31. HILL R.L., CUMBER R.A., ALLAN D.J. (1985). Parasitoids introduced to attack larvae of the Noctuidae (Lepidoptera) and their establishment in New Zealand 1968-1978. DSIR Entomology Division Report. Auckland, New Zealand: DSIR Entomology Division, 24pp. En.

32. HIRAI K. (1982). Outbreaks of the armyworm, Pseudaletia separata Walker, in and around West Japan in early summer 1980, with analysis of weather maps involved in the moths' displacement. Kinki Chugoku Agricultural Research, 64:66-68. Ja.

33. HIRAI K. (1982). Directional flow of male scent released by Pseudaletia separata (Lepidoptera: Noctuidae) and its repellent effect on adults and larvae of four noctuid and one phyticine moth. Journal of Chemical Ecology, 8:1263-1270. En.

34. HIRAI K. (1984). Migration of Pseudaletia separata Walker (Lepidoptera: Noctuidae): considerations of factors affecting time of taking-off and flight period. Applied Entomology and Zoology, 19:422-429. En.

35. HIRAI K. (1984). Notes on Apanteles kariyai Watanabe (Hymenoptera: Braconidae), a parasitoid of the armyworm, Pseudaletia separata Walker. Annual Report of the Society of Plant Protection of North Japan, 35:154-156. Ja,en.

36. HIRAI K., MIYAHARA Y., SATO M., FUJIMURA T., YOSHIDA A. (1985). Outbreaks of the armyworm, Pseudaletia separata Walker (Lepidoptera: Noctuidae) in northern Japan in mid-July of 1984, with analysis of weather maps involved in the moths' displacement. Japanese Journal of Applied Entomology and Zoology, 29(3):250-253. Ja,en.

37. HIRAI K., SANTA H. (1983). Comparative physio-ecological studies on the armyworms, Pseudaletia separata Walker and Leucania loreyi Duponchel (Lepidoptera: Noctuidae). Bulletin of the Chugoku National Agricultural Experiment Station, 21:55-101. Ja,en.

38. HUANG K.-H., HAO W.W. (1966). Studies on the flight of the armyworm moth Leucania separata. 1. Flight duration and wingbeat frequency. Acta Entomologica Sinica, 15:96-104. Ch.

39. IWAO S. (1967). Insect population quality and meteorological conditions. International Journal of Biometeorology, 11:33-37. En.

40. IWAO S. (1983). Phase variation in insects. Researches on Population Ecology, 3:3-14. En.

41. JOHNSON C.G. (1969). Migration and dispersal of insects by flight. London: Methuen & Co. Ltd., xxii+763pp. En.

42. KANDA K., NAITO A. (1982). Oviposition habits of armyworm (Pseudaletia separata Walker) and its application to cultural control in the maize field. Bulletin of the National Grassland Research Institute, 23:31-41. Ja,en.

43. KANDA K., NAITO A.(1984). Cold-hardiness and overwintering of the armyworm, Pseudaletia separata Walker. Bulletin of the National Grassland Research Institute, 27:25-36. Ja,en.

44. KANDA K.-I., MAKI T., SOMETANI K. (1977). An outbreak of armyworm, Leucania separata on grassland in Ishikawa Prefecture, Japan and factors which caused it. Journal of the Japanese Society of Grassland Science, 23:166-168. Ja.

45. KAO W.T. (1980). Studies on the phototactic behaviour of nocturnal moths: analysis of the causes of flight towards a lamp. Acta Entomologica Sinica, 23:369-373. Ch,en.

46. KHAMPARIA D.K., RATHORE V.S., JAKHMOLA S.S., PATEL R.K. (1982). Economic threshold and economic injury level of Mythimna separata (Walker) on rice. Indian Journal of Plant Protection, 9:88-93. En.

47. KIRITANI K. (1972). Strategy in integrated control of rice pests. Review of Plant Protection Research, 5:76-104. En.

48. KISIMOTO R., DYCK V.A. (1976). Climate and rice insects. In: Proceedings of the Symposium on Climate and Rice. pp. 376-390. Los Banos, Philippines: International Rice Research Institute. En.

49. LEARMONTH S.E. (1981). Exotic parasite helps control of Ord armyworms. Journal of Agriculture, Western Australia, 22:59. En.

50. LEWIS T. (1983). Pest forecasting systems in China. EPPO Bulletin, 13:125-126. En,Fr,Ru.

51. LI L.-Y. (1982). Integrated rice insect pest control in the Guangdong province of China. Entomophaga, 27:81-88. En.

52. LI K.-P., WONG H.-H., & WOO W.-S. (1964). Route of the seasonal migration of the Oriental armyworm moth in the eastern part of China as indicated by a three-year result of releasing and recapturing marked moths. Acta Phytophylacica Sinica, 3:101-110. (Review of Applied Entomology (A), 53:391.) Ch,en.

53. LIN Y.-M., CHOW Y.-S., TZENG H.-C. (1982). Field trapping of the diamondback moth Plutella xylostella and Pseudaletia separata using the synthetic sex pheromone of the diamondback moth. Bulletin of the Institute of Zoology and Academic Science (Taipei), 21:121-128. En.

54. LITSINGER J.A., CANAPI B., ALVIOLA A. (1982). Farmer perception and control of rice pests in Solana, Cagayan Valley, a pre-Green Revolution area of the Philippines. Philippine Entomologist, 5:373-383. En.

55. LONGWORTH J.F. (1980). Insect control what tools do we have? (Ed. Q.W. Ruscoe) New Zealand Department of Scientific and Industrial Research Bulletin 228, xiii+102pp. En.

56. MAHAL M.S., BAINS S.S. (1983). Role of various mortality factors in population fluctuations of Mythimna separata (Walker) in wheat. In: Insect Ecology and Resource Management. (Ed. S.C. Goel) pp. 62-70. Muzaffarnagar, India: Snatan Dham College. En.

57. MALONE L.A., WIGLEY P.J., DHANA S.D. (1985). A flagellate protozoan from Mythimna separata (Lepidoptera: Noctuidae). New Zealand Journal of Zoology, 12:155-157. En.

58. MATHUR Y.K., UPADHYAY K.D. (1982). Field evaluation of some modern insecticides against armyworm (Mythimna separata Wlk.) attacking paddy crop. Indian Journal of Plant Protection, 9:74-77. En.

59. MEHTO D.N., SINGH K.M. (1983). Succession of insect pests in chickpea, Cicer arietinum Linn. Indian Journal of Entomology, 45:377-383. En.

60. MICHAEL P.J., WOODS W., LAWRENCE P.J., FISHER W. (1984). Introduced parasites for the control of Australian noctuid pests. In: Pest control: recent advances and future prospects. Proceedings of the Fourth Australian Applied Entomological Research Conference, Adelaide 24-28 September 1984. (Eds. P. Bailey and D. Swincer) pp. 294-303. Adelaide, Australia: South Australian Government Printer. En.

61. MINISTRY OF AGRICULTURE AND LANDS, SOLOMON ISLANDS. (1980). Annual Report of the Entomologist 1980. Solomon Islands: Ministry of Agriculture and Lands, 40pp. En.

62. MORAY P.E., KAZI S.K., BALLAL A.S. (1983). Influence of weather factors on the outbreak of armyworms. Journal of Maharashtra Agricultural University, 8:128-131. En.

63. MOTE U.N. (1984). Occurrence of Armyworm Mythimna separata on rabi sorghum. Journal of Maharashtra Agricultural University, 9:230. En.

64. NAITO A., KANDA K.-I., MIYAZAKI M. (1977). Studies on cultural control of insect pests of grasses. II. Effects of pure and mixed stands of grasses in pasture on occurrence of insect pests. Bulletin of the National Grassland Research Institute, 11:120-130. En.

65. NEELGUND Y.F., MATHAD S.B. (1974). Comparative studies of developments of the armyworm Pseudaletia separata reared on Napier grass and artificial diet. Journal of Karnatak University of Science, 19:7-13. En.

66. NODA H., TANAKA S., HAMA H. (1984). Outbreak of armyworm, Pseudaletia separata (Mythimna separata) after flooding of paddy fields (Lepidoptera: Noctuidae). Japanese Journal of Applied Entomology and Zoology, 28:94-96. Ja,en.

67. OKU T. (1981). Notes on some grass feeding noctuids of the genus Mythimna in Tohoku district. Annual Report of Plant Protection, North Japan, 32:42-43. Ja.

68. OKU T. (1983). Annual and geographical distribution of crop infestation in northern Japan by the Oriental armyworm in special relation to the migration phenomena. Miscellaneous Publication of the Tohoku National Agricultural Experiment Station, 3:1-49. Ja,en.

69. OKU T., CHIBA T., TOKI A., KOBAYASHI T. (1976). Further notes on the early summer outbreak of the Oriental armyworm on grasslands of Tohoku District Japan 1971. Journal of the Japanese Society of Grassland Science, 22:206-210. Ja.

70. OKU T., MIYAHARA Y., KOBAYASHI T. (1982). Recent outbreaks of grassland pest insects in the Tohoku district Japan. 1. Outbreaks of noctuid pests. Journal of the Japanese Society of Grassland Science, 28:117-121. Ja.

71. OKU T., TOKI A., KOYAMA J., FUJIMURA T. (1979). Further notes on the 1st generation outbreak of the Oriental armyworm in northern Japan 1972. Journal of the Japanese Society of Grassland Science, 24:331-336. Ja.

72. PANDE Y.D., GANGULI R.N. (1985). Some ecological observations on ear-cutting caterpillars (Mythimna spp.) infesting paddy in Tripura, India. Entomon, 10:297-300. En.

73. PAPEL R.K., KHATRI A.K., CHOUDHARY B.S. (1981). Rice ear-cutting caterpillar, an injurious pest at panicle stage. International Rice Research Newsletter, 6(3):17. En.

74. PATANAKAMJORN S., WONGTONG S., CHARERNSOM K., JAMORNMARN S. (1975). Insect pests of maize and sorghum in Thailand and their control. In: Kasetsart University, Thailand: Research projects. Annual report 1974-1975. pp. 139-149. Bangkok, Thailand. Th,en.

75. PATEL R.K. (1972). Effect on time of application of diazinon granular insecticide against paddy armyworm. Pesticides (Bombay), 6:17. En.

76. PAWAR A.D., BANERJEE S.N. (1976). Important insect pests of rice and their distribution and economic status in the different states of India. Plant Protection Gleanings, 6:1-4. En.

77. PU Z.L., GU D.X., ZHOU H.H., TANG J.Q., ZHANG R.J., ZHANG X.D. (1984). Integrated control of rice pest insects in Dasha township, Sihui County, Guangdong Province. Scientia Agricultura Sinica, (1984/4):73-80. Ch,en.

78. RAINEY R.C. (1982). Putting insects on the map: spatial inhomogeneity and the dynamics of insect populations. Antenna, 6:162-169. En.

79. RAINEY R.C. (1983). Monitoring and forecasting major migrant pests: ecology and technology. In: 10th International Congress of Plant Protection 1983. Volume 1. Plant protection for human welfare. Proceedings of a conference held at Brighton, England, 20-25 November, 1983. p. 178. Croydon, United Kingdom: British Crop Protection Council. En.

80. RISHI N.D. (1975). Occurrence, bionomics and control of Pseudaletia separata, (Lepidoptera: Noctuidae), a cereal pest in Kashmir. Indian Science Congress Association Proceedings, 62:79. En.

81. RIZVI S.M.A., SINGH H.M. (1980). Natural enemies of paddy cutworm, Mythimna separata (Walker). Oryza, 17(3):244-245. En.

82. RIZVI S.M.A., SINGH H.M. (1981). Chemical control of paddy cutworm Mythimna separata(Wlk). Oryza, 18:112-113. En.

83. ROELOFS W.L., CARDE R.T. (1977). Responses of lepidoptera to synthetic sex pheromone chemicals and their analogs. Annual Review of Entomology, 22:377-405. En.

84. ROER H. (1974). Wanderinsekten Forschung in Europa. Folia Entomologica Hungary, 27:49-70. Ge.

85. SAINI S.S. (1983). A brief note on outbreak of armyworm (Mythimna separata Haworth) on wheat and oat in April, 1980 in the Punjab. Plant Protection Bulletin, India, 33:35. En.

86. SAINI S.S., RAM N. (1986). Role of rice-wheat crop rotation in the population build-up of armyworms in Punjab, India. Indian Journal of Ecology, 12:380-381.En.

87. SATO Y., TANAKA T. (1984). Effect of the number of parasitoid (Apanteles kariyai) eggs (Hym.: Braconidae) on the growth of host (Leucania separata) larvae (Lep.: Noctuidae). Entomophaga, 29:21-28. En,fr.

88. SATO Y., TANAKA T., IMAFUKU M., HIDAKA T. (1983). How does diurnal Apanteles kariyai parasitize and egress from a nocturnal host larva? Kontyu, 51:128-139. En.

89. SAVANURMATH C.J., MATHAD S.B. (1981). Efficacy of fenitrothion and nuclear polyhedrosis virus combinations against the armyworm Mythimna separata Lepidoptera Noctuidae. Zeitschrift fur Angewandte Entomologie, 91:464-474. En.

90. SCHMUTTERER H., SAXENA R.C., VON DER HEYDE J. (1983). Morphogenetic effects of some partially purified fractions and methanolic extracts of neem seeds on Mythimna separata and Cnaphalocrocis medinalis. Zeitschrift fur Angewandte Entomologie, 95:230-237. En.

91. SHARMA H.C., DAVIES J.C. (1983). The Oriental armyworm, Mythimna separata (Wlk). Distribution, biology and control: a literature review. Centre for Overseas Pest Research Miscellaneous Report No. 59, 24pp. En.

92. SHARMA H.C., LEUSCHNER K., SANKARAM A.V.B., GUNASEKHAR D., MARTHANDAMURTHI M., BHASKARIAH K., SUBRAMANYAM M., SULTANA N. (1984). Insect antifeedants and growth inhibitors from Azadirachta indica and Plumbago zeylanica. In: Proceedings of the International Neem Conference, No. 2. Natural Pesticides from the Neem tree (Azadirachta indica A. Juss) and other Tropical Plants. pp. 291-320. Patancheru, India: International Crops Research Institute for the Semi-Arid Tropics. En.

93. SHIMIZU T., YAGI S. (1983). Feeding manner of lepidopterous larvae: the cabbage armyworm Mamestra brassicae and the common armyworm Leucania separata (Lepidoptera: Noctuidae). Applied Entomology and Zoology, 18:278-280. En.

94. SINCHAISRI N. (1971). Systemic insecticides for the control of the armyworm Leucania separata. Thai Journal of Agricultural Science, 4:13-16. En.

95. SINCHAISRI N. (1972). Biological studies on the armyworm Leucania separata. Part 1. The determination of the larval instar by means of head capsule measurement. Thai Journal of Agricultural Science, 5:157-163. En.

96. SINGH D. (1981). Influence of the time of application of insecticides on the mortality of the rice ear-cutting caterpillar Mythimna separata. Indian Journal of Agricultural Science, 51:113-115. En.

97. SINGH P., SURREY M.R. (1980). A plastic container for rearing insects on artificial diets. New Zealand Journal of Zoology, 7:441-442. En.

98. SINGH R., MRIG K.K., CHAUDHARY J.P. (1987). Incidence and survival of Mythimna species on cereal crops in Hisar, India. Indian Journal of Agricultural Science, 57:59-60. En.

99. SUN J. (1986). A preliminary report on results determined by analysis of the contents of sugar, lipid and protein between different generations and in different areas of armyworms, Mythimna separata (Walker). Scientia Agricultura Sinica, (1986/6):70-75. Ch,en.

100. TAGAWA J., SATO Y., TANAKA T. (1982). Developmental interactions between the armyworm Leucania separata (Lepidoptera: Noctuidae) and its parasite Apanteles ruficrus (Hymenoptera: Braconidae). Entomophaga, 27:447-454. En,fr.

101. TAKAHASHI S. (1983). Simultaneous attraction of three armyworm species to the synthetic sex pheromone of the rice armyworm, Pseudaletia separata (Walker). Memoirs of the College of Agriculture, Kyoto University, 122:37-41. En.

102. TANAKA T., SATO Y., HIDAKA T. (1984). Developmental interaction between Leucania separata (Lepidoptera: Noctuidae) and its braconid parasitoid, Microplitis mediator (Hymenoptera: Braconidae). Journal of Economic Entomology, 77:91-91. En.

103. TRIPATHI A.K., BHATTACHARYA A.K., VERMA S.K. (1982). Developmental behaviour of Mythimna separata (Walker) on some monocotyledonous plants. Indian Journal of Entomology, 44:355-367. En.

104. TRIPATHI A.K., BHATTACHARYA A.K., VERMA S.K. (1982). A note on the feeding behaviour of Mythimna separata (Walker) on some dicotyledonous plants. Indian Journal of Entomology, 44:285-286. En.

105. TRIPATHI A.K., BHATTACHARYA A.K., VERMA S.K. (1984). Relative efficacy of some synthetic pyrethroids and commonly used insecticides against Mythimna separata. Pesticides (Bombay), 18(10):32-33. En.

106. WANG W.-L., BI F.-C., WANG X.-L., HUANG R.-Q. (1985). The insecticidal characteristics of the new pyrethroid-like Oxime 809. Acta Entomologica Sinica, 28:346-347. Ch.

107. WEI X.P. (1982). Observations on the life-cycle of Mythimna separata (Walker) and its natural enemies in western Guangxi Zhuang Autonomous Region. Kunchong Zhishi, 19(3):15-17. Ch.

108. WEI Z.H., PANG F.M. (1986). Preliminary report on the sex pheromone of the armyworm Mythimna separata. Acta Entomologica Sinica, 28(3):348-350. Ch.

109. WILDE G., APOSTOL R. (1983). Armyworm (Lepidoptera: Noctuidae) resistance in rice. Environmental Entomology, 12:376-379. En.

110. WU J.T. (1982). Distribution, seasonal occurrence and natural enemies of armyworm attacking rice in China. International Rice Research Newsletter, 7(2):9-10. En.

111. YANG Y., HE D., ZHU S., YANG P., ZHOU Y. (1984). Studies on the generations and migration of the armyworm Mythimna separata in Yunnan province China. Zoological Research, 5:1-20. Ch.

112. YING S.H. (1982). The ovicidal activity of some new insecticides. Acta Entomologica Sinica, 25(3):289-293. Ch,en.

113. ZHAO S.-J., ZHOU C.-D. (1986). Models for medium- and long-range forecasting of the amount of migration of first-generation moths into the outbreaking area of the second-generation armyworm. Advances in Atmospheric Sciences, 3(3):379-384. En.

SUBJECT INDEX

FLIGHT PHYSIOLOGY AND BEHAVIOUR

Type of study	Comments	Reference number, senior author, date
Laboratory	Effect of larval rearing density on flight activity.	30. Hill, M.G. et al. (1986).
Laboratory	Factors affecting take-off time and flight duration.	34. Hirai, K. (1984).
Laboratory	Factors affecting flight duration and wing-beat frequency.	38. Huang, K.-H. et al. (1966).
Field/ laboratory	General review of insect migration.	41. Johnson, C.G. (1969).
Field	Flight behaviour towards UV light.	45. Kao, W.T. (1980).
Laboratory	Sugar, lipid and protein content of migrating armyworm moths.	99. Sun, J. (1986).

PHEROMONES

Laboratory	Structure and evolution of the male pheromone system in Noctuidae.	16. Clearwater, J.R. (1975).
Laboratory	Repellent effect of male scent.	33. Hirai, K. (1982).
Field	Trapping by synthetic sex pheromone.	53. Lin, Y.-M. et al. (1982).
Laboratory/ field	Review of lepidopteran pheromones. Mentions role of male pheromone in M. separata.	83. Roelofs, W.L. et al. (1977).
Laboratory/ field	Sex pheromone identified. Synthetic preparation used in traps.	101. Takahashi, S. (1983).
Laboratory	Preliminary report on sex pheromone.	109. Wei, Z.H. et al. (1986).

REPRODUCTION

Laboratory	Translocation and function of semen in female reproductive system.	11. Chao, W.Y. (1981).
Laboratory	Effect of larval rearing density on fecundity.	30. Hill, M.G. et al. (1986).
Laboratory	Relationship between flight and reproduction.	34. Hirai, K. (1984).
Laboratory/ field	Physio-ecological studies including fecundity.	37. Hirai, K. et al. (1983).
Laboratory/ field	Oviposition behaviour.	42. Kanda, K. et al. (1982).

DEVELOPMENT

Laboratory	Walking speed and orientation of larvae related to rearing density.	1. Atsuhiro, S. (1969).
Laboratory/ field	Effect of temperature and photoperiod on development.	3. Berger, L.P. (1984).
Laboratory	Development times on new artificial diet.	5. Bi, F.C. (1983).
Field/ laboratory	Relations between larval development and humidity.	12. Chin, T.-S. (1979).
Laboratory/ field	Physio-ecological studies including effect of temperature and diet on development.	37. Hirai, K. et al. (1983).
Field	Phase variation.	40. Iwao, S. (1967).
Laboratory/ field	Cold-hardiness and overwintering of larvae.	43. Kanda, K. et al. (1984).
Laboratory	Rearing on napier grass and artificial diet.	65. Neelgund, Y.F. et al. (1974).
Laboratory	Effect of number of parasitoid eggs on development of host larvae.	87. Sato, Y. et al. (1984).

Laboratory	Larval instar determination by head capsule measurement.	95.	Sinchaisri, N. (1972).
Laboratory	Developmental interactions between armyworm and braconid parasitoid.	100.	Tagawa, J. et al. (1984).
Laboratory	Developmental interaction between armyworm and braconid parasitoid.	102.	Tanaka, T. et al. (1984).
Laboratory	Development on monocotyledons.	103.	Tripathi, A.K. et al. (1982).
Laboratory	Poor development on dicotyledons.	104.	Tripathi, A.K. et al. (1982).
Field	Observations on life cycle.	107.	Wei, X.P. (1982).

ECOLOGY

GENERAL

Field	Outbreak on rice in Manipur, India.	2.	Barwal, R.N. (1983).
Field	Armyworm in paddy and deepwater rice in Bangladesh.	9.	Catling, H.D. (1980).
Field	Insect pests of corn in Indonesia.	15.	Chu, Y.-I. (1979).
Field	Pests of cereals in New Zealand.	17.	Cromey, M.G. et al. (1980).
Field	Outbreak on wheat in northern India.	19.	Deol, G.S. (1982).
Field	Incidence on maize cobs in Karnataka, India.	25.	Govindan, R. et al.(1981).
Field	Spatial distribution of armyworm and braconid parasitoid.	29.	Hill, M.G. et al. (1983).
Field	Outbreaks in relation to moth migration and weather.	32.	Hirai, K. (1982).

Laboratory/ field	Physio-ecological studies.	37. Hirai, K. et al.(1983).
Field	Differences in behaviour and ecology between different phases of armyworms.	39. Iwao, S. (1967).
Field	Phase variation in M. separata.	40. Iwao, S. (1983).
Field	Armyworm outbreaks related to heavy manuring of rice in Japan.	47. Kiritani, K. (1972).
Field	The succession of pests, including armyworm, on chickpea in India.	59. Mehto, D.N. et al. (1983).
Field	Heavy incidence on 'rabi' season sorghum in Maharashtra, India.	63. Mote, U.N. (1984).
Field	Grass-feeding noctuids in Tohoku, Japan.	67. Oku, T. (1981).
Field	Observations of biology and life cycle on rice in Jabalpur, India.	73. Papel, R.K. et al. (1981).
Field	Pests of maize and sorghum in Thailand.	74. Patankamjorn, S. (1975).
Field	Distribution of rice pests in the Indian states.	76. Pawar, A.D. et al. (1976).
Field	Occurrence, bionomics and control in Kashmir.	80. Rishi, N.D. (1975).
Field	Outbreak on wheat and oats in Punjab, India.	85. Saini, S.S. (1983).
Laboratory	Feeding behaviour.	93. Shimizu, T. et al. (1983).
Field	Incidence and survival on cereals in Hissar, India.	98. Singh, R. et al. (1987).
Field	Distribution and seasonal occurrence in China.	110. Wu, J.T. (1982).

POPULATION DYNAMICS

Field/ laboratory	Relations between humidity and population dynamics.	12. Chin, T-S. (1979).
Field	Role of parasite and virus in population decline.	22. Dilawari, V.K. et al. (1981).
Laboratory	Adult responses to larval rearing density.	30. Hill, M.G. et al. (1986).
Field	Outbreak in Japan caused by mass laying and low numbers of natural enemies.	44. Kanda, K.-I. et al. (1977).
Field	Review of outbreaks related to weather factors.	48. Kisimoto, R. et al. (1976).
Field	Mortality factors and population fluctuations in wheat.	56. Mahal, M.-S. et al. (1983).
Field	Outbreaks and weather factors in Maharashtra, India.	62. Moray, P.E. et al. (1983).
Field	Outbreaks after flooding in paddy fields.	66. Noda, H. et al. (1984).
Field	Outbreaks in Japan caused by immigration from China.	69. Oku, T. et al. (1976).
Field	Outbreaks in northern Japan.	70. Oku, T. et al. (1982).
Field	Outbreak in northern Japan caused by immigration from China.	71. Oku, T. et al. (1979).
Field	Ecological observations on paddy in Tripura, India.	72. Pande, Y.D. et al. (1986).
Field	Integrated control of rice pest insects.	77. Pu, Z.L. et al. (1984).
Field	Rice/wheat rotation and population build-up.	86. Saini, S.S. et al. (1986).

MIGRATION AND DISPERSAL

Field	Outbreaks in relation to moth migration and weather.	32. Hirai, K. (1982).
Laboratory	Factors affecting take-off time and flight duration.	34. Hirai, R. (1984).
Field	Northern Japanese outbreaks related to moth migration and weather.	36. Hirai, K. et al (1984).
Field	General review of migration and dispersal.	41. Johnson, C.G. (1969).
Field	Review of armyworm immigration and outbreaks in relation to weather.	48. Kisimoto, R. et al. (1976).
Field	Seasonal migration in China studied by mark-recapture.	52. Li, K.-P. et al (1964).
Field	Infestation by airborne immigrants to Japan.	68. Oku, T. (1983).
Field	Outbreaks in northern Japan caused by immigration from China.	69. Oku, T. et al. (1976).
Field	Outbreak in northern Japan caused by immigration from China.	71. Oku, T. et al. (1979).
Field	Mapping of insect migration and distribution changes.	78. Rainey, R.C. (1982).
Laboratory/ field	Monitoring and forecasting migrant pests. Migration on monsoon winds.	79. Rainey, R.C. (1983).
Field	Review of migratory behaviour in Lepidoptera.	84. Roer, H. (1974).
Laboratory	Sugar, lipid and protein content of migrating armyworm moths.	99. Sun, J. (1986).
Field	Temperature effects on migration. Outbreaks explained by migration.	111. Yang, Y. et al. (1984).

Field	Number of moths migrating into an outbreak area predicted from weather factors.	113. Zhao, et al. (1986).

CONTROL

BIOLOGICAL CONTROL

Laboratory	Sterilisation by gamma rays.	1Ø. Chao, W.Y. (198Ø).
Laboratory	Larvae sensitive to antifeedants from Meliaceae.	14. Chiu, S.F. (1985).
Laboratory	Braconid parasitoid and virus caused high natural mortality.	22. Dilawari, V.K. et al. (1981).
Laboratory/ field	Possibility of use of viruses in control of armyworms in Solomon Islands.	24. Entwhistle, P.F. (1985).
Laboratory	Braconid parasitoid reduced armyworm larval food consumption and may thus reduce plant damage.	26. Hill, M.G. (1986).
Field	Spatial distribution of armyworm and braconid parasitoid.	29. Hill, M.G. et al. (1983).
Field	Introduced braconid parasitoid of armyworm larvae established in New Zealand.	31. Hill, R.L. et al. (1985).
Laboratory	Repellent effect of male scent.	33. Hirai, K. (1982).
Laboratory	Notes on biology of braconid parasitoid of armyworm.	35. Hirai, K. (1984).
Field/ laboratory	Oviposition habits and cultural control in maize.	42. Kanda, K. et al. (1982).
Field	Control by introduced parasitoid.	49. Learmonth, S.E. (1981).
Field	Trapping by synthetic pheromone.	53. Lin, Y.-M. et al. (1982).

Laboratory/ field	Control by virus and parasitoids.	55. Longworth, J.F. (1980).
Laboratory	Flagellate protozoan infects armyworm.	57. Malone, L.A. et al. (1985).
Laboratory/ field	Insect parasitoids introduced for control.	60. Michael, P.J. et al. (1984).
Field	Effect of pure and mixed stands of grasses on natural enemies.	64. Naito, A. et al. (1977).
Field	Integrated control of rice pests.	77. Pu, Z.L. (1984).
Field	Parasitoids of army-worm in Uttar Pradesh, India.	81. Rizvi, S.M.A. (1980).
Laboratory	Effect of braconid parasitoid on growth of host larvae.	87. Sato, Y. et al. (1984).
Laboratory	Behaviour of braconid parasitoid.	88. Sato, Y. et al. (1983).
Laboratory	Effects of fenitrothion and nuclear polyhedrosis virus.	89. Savanurmath, C.J. et al. (1981).
Laboratory	Morphogenetic effects of extracts of neem seeds.	90. Schmutterer, H. et al.(1983).
Laboratory	Natural antifeedants and growth inhibitors.	92. Sharma, H.C. et al. (1984).
Laboratory	Developmental inter-actions between army-worm and braconid parasitoid.	100. Tagawa, J. et al. (1982).
Laboratory/ field	Synthetic sex pheromone used in traps.	101. Takahashi, S. (1983).
Field	Developmental inter-action between army-worm and braconid parasitoid.	102. Tanaka, T. et al. (1984).
Field	Parasitoid infestation in armyworm populations.	107. Wei, X.P. (1982).
Field	Natural enemies.	110. Wu, J.T. (1982).

INTEGRATED CONTROL

Field	Integrated control on rice in China.	13. Chiu, S.F. (1984).
Field	Integrated control of rice pests in China.	51. Li, L.-Y. (1982).
Field	Farmer perception and control in rice.	54. Litsinger, J.A. et al. (1982).
Field	Integrated control of rice pests in China.	77. Pu, Z.L. (1984).
Laboratory	Effect of fenitrothion and nuclear polyhedrosis virus.	89. Savanurmath, C.J. et al. (1981).

CHEMICAL CONTROL

Field	Chemical control on rice in Manipur, India.	2. Barwal, R.N. (1983).
Laboratory	Injection toxicity of pyrethroids.	6. Brempong-Yeboah, C.Y. et al. (1983).
Laboratory	Cuticle penetration of synthetic pyrethroids.	7. Brempong-Yeboah, C.Y. et al. (1984).
Laboratory	Toxicity of some pyrethroids tested by topical application.	8. Brempong-Yeboah, C.Y. et al. (1982).
Field	Note on insecticide used against outbreak on wheat in northern India.	19. Deol, G.S. (1982).
Field	Insecticidal control on wheat in northern India.	20. Deol, G.S. et al. (1981).
Field	Chemical control on maize in India.	21. Deshpande, R.R. et al. (1983).
Field	Field evaluation of insecticides on rice.	58. Mathur, Y.K. et al. (1982).
Laboratory	Insecticide tests on armyworm larvae reported.	61. Ministry of Agriculture and Lands, Solomon Islands. (1980).

Field	Control of maize and sorghum pests in Thailand.	74. Patankamjorn, S. et al. undated.
Field	Effect of time of application of diazinon.	75. Patel, R.K. (1972).
Field	Chemical control in rice.	82. Rizvi, S.M.A. et al. (1981).
Field	Synthetic pyrethroids and other insecticides.	105. Tripathi, A.K. et al. (1984).
Laboratory	Insecticidal characteristics of Oxime 809.	106. Wang, W.-L. et al. (1985).
Laboratory	Ovicidal activity of new insecticides.	112. Ying, S.H. (1982).

TECHNIQUES

Laboratory	Method of assessing locomotive activity of larvae.	1. Atsuhiro, S. (1969).
Laboratory	A new artificial diet.	4. Bi, F.C. (1981).
Laboratory	Simple artificial diet for rearing larvae.	5. Bi, F.C. (1983).
Laboratory	Rearing Lepidoptera on artificial diet.	18. Dass, R. et al. (1984).
Laboratory	Rearing methods, flight balance.	30. Hill, M.G. et al. (1986).
Laboratory/ field	Rearing method, larval diet.	37. Hirai, K. et al. (1983).
Field	Field-trapping with synthetic sex pheromone.	53. Lin, Y.-M. et al. (1982).
Laboratory	Comparative development on Napier grass and artificial diet.	65. Neelgund, Y.F. et al. (1974).
Field	Mapping techniques reveal migrations.	78. Rainey, R.C. (1983).
Laboratory	Larval instar determination by head capsule measurements.	95. Sinchaisri, N. (1972).

Field	Mortality and insecticide application time.	96. Singh, D. (1981).
Laboratory	Plastic containers for rearing on artificial diets.	97. Singh, P. et al. (1980).

PEST FORECASTING

Field	Population trends predicted from rainfall, humidity and initial population size.	12. Chin, T.-S. (1979).
Field	Forecasting systems in China.	50. Lewis, T. (1983).
Field	Monitoring and forecasting major migrant pests.	79. Rainey, R.C. (1983).
Field	Regression models used to predict the number of moths migrating into an outbreak area.	113. Zhao, S.-J. et al. (1986).

DAMAGE, YIELD AND ECONOMIC THRESHOLD

Field	Introduced rice varieties damaged more than local varieties.	2. Barwal, R.N. (1983).
Field	Time and extent of defoliation on grain yield of maize.	23. Douglas, J.A. et al. (1981).
Laboratory/ field	Maize yield response to simulated defoliation.	27. Hill, M.G. et al. (1986).
Field	Defoliation and maize yeild.	28. Hill, M.G. et al. (1981).
Field	Economic threshold on rice.	46. Khamparia, D.K. et al. (1982).
Field	Heavy incidence on 'rabi' season sorghum in Maharashtra, India.	63. Mote, U.N. (1984).
Field	Injury at panicle stage on rice.	73. Papel, R.K. et al. (1981).
Field	Distribution and economic status of rice pests.	76. Pawar, A.D. et al. (1976).

INDEX OF HOST CROPS

RICE

SORGHUM

MILLET

OATS

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MAIZE

15. Chu, Y.-I. (1979).
21. Deshpande, R.R. et al. (1983).
23. Douglas, J.A. et al. (1981).
25. Govindan, R. et al. (1981).
27. Hill, M.G. et al. (1986).
28. Hill, M.G. et al. (1982).
29. Hill, M.G. et al. (1983).
42. Kanda, K. et al. (1982).
49. Learmonth, S.E. (1981).
51. Li, L.-Y. (1982).
74. Patankamjorn, S., undated.
104. Tripathi, A.K. et al. (1982).

CEREALS (GENERAL)

17. Cromey, M.G. et al. (1980).
49. Learmonth, S.E. (1981).
50. Lewis, T. (1983).
80. Rishi, N.D. (1975).
98. Singh, R. et al. (1987).

COTTON

51. Li, L.-Y. (1982).

PASTURE GRASS

44. Kanda, K.-I. et al. (1977).
64. Naito, A. et al. (1977).
69. Oku, T. et al. (1976).
71. Oku, T. et al. (1979).
104. Tripathi, A.K. et al. (1982).

SUGAR CANE

49. Learmonth, S.E. (1981).
104. Tripathi, A.K. et al. (1982).

SUNFLOWER, SOYA BEAN, PEA AND TOMATO

105. Tripathi, A.K. et al. (1982).

CHICKPEA

59. Mehto, D.N. et al. (1983).

GEOGRAPHICAL INDEX
(Research locality)

Locality	Number, senior author, date
JAPAN	
Western Japan.	32. Hirai, K. (1982).
Northern Japan.	36. Hirai, K. et al. (1985).
Chugoku.	37. Hirai, K. et al. (1983).
	39. Iwao, S. (1983).
Tochigi.	42. Kanda, K. et al. (1982).
Ishikawa.	44. Kanda, K.-I. et al. (1977).
	47. Kiritani, K. (1972).
	66. Noda, H. et al. (1984).
Tohoku.	67. Oku, T. (1981).
Tohoku.	68. Oku, T. (1983).
Tohoku.	69. Oku, T. et al. (1976).
Tohoku.	70. Oku, T. et al. (1982).
Tohoku.	71. Oku, T. et al. (1979).
	101. Takahashi, S. (1983).
ASIATIC SOVIET UNION	
	3. Berger, L.P. (1984).
CHINA	
Nankai.	4. Bi, F.C. (1981).
Tianjin.	5. Bi, F.C. (1983).
Kungming.	10. Chao, W.Y. (1980).
Guangdong	13. Chiu, S.F. (1984).
Guangdong.	14. Chiu, S.F. (1985).
Taipei.	15. Chu, Y.I. (1979).
	44. Kao, W.T. (1980).
	50. Lewis, T. (1983).
Guangdong	51. Li, L.-Y. (1982).
Several in E. China.	52. Li, K.-P. (1964).
Guangdong	77. Pu. Z.L. et al. (1984).
	78. Rainey, R.C. (1982).
	99. Sun, J. (1986).
Guangxi Zhuang	107. Wei, X.P. (1982).
	108. Wei, Z.H. et al. (1986).
Guangdong.	110. Wu, J.T. (1982).
Yunnan.	111. Yang, Y. et al. (1984).
Shanghai	112. Ying, S.H. (1982).
	113. Zhao, S.-J. (1986).
INDIA	
Manipur.	2. Barwal, R.N. (1983).
New Delhi.	18. Dass, R. et al. (1984).
Punjab.	19. Deol, G.S. (1984).
Punjab.	20. Deol, G.S. et al. (1981).

Locality	Number, senior author, date
INDIA (continued)	
Madhya Pradesh.	21. Deshpande, R.R. et al. (1983).
Karnataka.	25. Govindan, R. et al. (1981).
Madhya Pradesh.	46. Khamparia, D.K. et al. (1982).
Punjab.	56. Mahal, M.S. et al. (1983).
Uttar Pradesh.	58. Mathur, Y.K. et al. (1982).
Delhi.	59. Mehto, D.N. et al. (1983).
Maharashtra.	62. Moray, P.E. et al. (1983).
Maharashtra.	63. Mote, U.N. (1984).
Jabalpur.	73. Papel, R.K. et al. (1981).
Madhya Pradesh.	75. Patel, R.K. (1980).
general.	76. Pawar, A.D. et al. (1976).
Kashmir.	80. Rishi, N.D. (1975).
Uttar Pradesh.	81. Rizvi, S.M.A. et al. (1980).
Uttar Pradesh.	82. Rizvi, S.M.A. et al. (1981).
Punjab.	85. Saini, S.S. (1983).
Punjab.	86. Saini, S.S. et al. (1986).
Karnataka.	89. Savanurmath, C.J. et al. (1981).
Uttar Pradesh.	96. Singh, D. (1981).
Haryana.	98. Singh, R. et al. (1987).
Uttar Pradesh.	103. Tripathi, A.K. et al. (1982).
Uttar Pradesh.	104. Tripathi, A.K. et al. (1982).
Uttar Pradesh.	105. Tripathi, A.K. et al. (1984).
BANGLADESH	
	9. Catling, H.D. (1980).
THAILAND	
	74. Patankamjorn, S. (undated).
PHILIPPINES	
	54. Litsinger, J.A. et al. (1984).
	109. Wilde, G. et al. (1983).
INDONESIA	
	15. Chu, Y.-I. (1979).
SOLOMON ISLANDS	
	61. Ministry of Agriculture and Lands, Solomon Islands. (1980).
AUSTRALIA	
	49. Learmonth, S.E. (1981).
	60. Michael, P.J. et al. (1984).

Locality	Number, senior author, date
NEW ZEALAND	
	17. Cromey, M.G. et al. (1980).
	27. Hill, M.G. et al. (1986).
	28. Hill, M.G. et al. (1982).
	29. Hill, M.G. et al. (1983).
	31. Hill, R.L. et al. (1985).
	57. Malone, L.A. et al. (1985).