SOME STUDIES ON ABUNDANCE OF TERMITES IN VARIOUS PLANT COMMUNITIES OF EASTERN BALUCHISTAN, PAKISTAN

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Abstract

Termite nest distribution in various plant communities of Eastern Baluchistan was studied. On the basis of termite nest density and extent of termite infested area it was concluded that out of 19 plant communities, four have serious (nest density > 124/ha, infested area 115m^2/ha, five have mild nest density 62 – 124/ha, 23 115m^2 and three have minor nest density < 62/ha, infested area > 23m^2/ha, termite infestation problem, while remaining seven plant communities have no termite problem. In almost all communities, distribution of termite nest was not uniform, (frequency < 50.0%).

Introduction

Termite mounds and nests form a characteristic feature of the landscape in tropical and sub-tropical areas of the world. Their pedological significance is related to their number and population of termites (Lee and wood, 1971). Some observations have been made on abundance of termite mounds in various forest types of South Africa (Murray, 1938), East Africa (Hesse, 1955), Central Asia (Ghilarov, 1962), Congo (Maldague, 1964; Bouillon and Mathot, 1964), Kenya (Glover et al, 1964), Australia (Watson and Gay, 1970, Wood and Lee, 1971), Malaysia (ABE; 1978) and Nigeria (Wood et al, 1982).

Pakistan with termite fauna of as many as 50 recorded termite species (Akhtar, 1974) has serious termite problem. But unfortunately there have been very few studies on this aspect of termite ecology. Kayani et al (1979) have studied frequency of termite nests in various vegetation types of Islamabad–Murree Hills and Quetta–Ziarat Hills areas. Kayani and Sheikh (1981, 1984) have made some observation types in the areas of Arid Marine Tropical Coastlands and Arid Sub-Tropical Continental Lowlands, respectively.

In the present work termite nest population in 19 different plant communities of Eastern Baluchistan (28.3. ^{o}N 30.3 ^{o}N 66.8 ^{o}E 68.3 ^{o}E was studied.

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MATERIALS AND METHODS

Sampling Sites

These studies were carried out in the surroundings (20 miles radius) of Bellpat (29°N, 68°E), Chattar (28.8 °N, 68.3 °E), Dera Murad Jamali (28.5. °N, 68.2. °E), Jhatpat (28.3.°N, 68.3. °E), Mach (29.8 °N, 67.4 °E), Mushkaf (29.5 °N 67.7 °E), Quetta (30.3 °N, 68.8 °E), Sibi (29.6 °N, 67.8 °E) and Usta Muhammad (28.2. °N, 67.8 °E) areas. A total of 21 stands were established for these studies.

Vegetation Study

Vegetation was studied by quadrat method (40 quadrats/stand) and data analysed after Curtis and Mclntosh, 1950. The details of method of vegetation study and floristic composition of these communities have already been described elsewhere (Kayani, 1984).

Termite Study

In each stand 40 quadrats of 10x4 m size were laid systematically. In each quadrat number of termite nest (mound, subterranean nest, galleries or ground, on living trees, stumps of wood and below cowdung and stones, etc.) was noted. In each case nest was exposed by digging and its size (length x width) was measured with the help of measuring tape.

Termite nest density, frequency and termite nest size was calculated as follows:–

$$\text{Density/acre} = \frac{\text{No. of termite nests in all quadrats}}{\text{Total area of all quadrats taken.}} \times 43560$$

$$\text{Frequency of occurence} = \frac{\text{No. of occurence of nests in all quadrats}}{\text{Total No. of all quadrats.}} \times 100$$

$$\text{Size/acre} = \frac{\text{Total size of all nests in all quadrats}}{\text{Total area of all quadrats.}} \times 43560$$

Results

Data pertaining to termite nest population in various communities (Table. 1) shows that density, frequency and magnitude of termite nest infested area vary from community to community.

Nest density: Five plant communities, i.e., *Crotolaria burhia Capparis decidua, Prosopis glandulosa-Suaeda fruticosa, Prosopis spicigera-Corchorus antichorus-Aerva tomentisa, Rhazya stricta – Haloxylon griffithi* and *Suaeda fruticosa – Salvadora persica – Tamarix articulata*

have high nest density. Three communities viz., *Cyperus rotundus – Tamarix articulata, Haloxylon griffithi* and *Prosopis spicigera – Capparis decidua* have intermediate nest density. (62 – 124). Four plant communities i.e., *Cynodon dactylon-Prosopis spicigera, Salsola foetida-Panicum repens, Suaeda fruticosa* and *Tamarix dioica – Tamarix gallica* have low nest density < 62/ha, while remaining seven plant communities are free from termite.

Frequency

Data presented in Table 1 shows that out of 12 plant communities, where termites were present, two plant communities (*Crotolaria burhia – Capparis decidua* and *Prosopis glandulosa – Suaeda fruticosa*) have high frequency of occurence. (> 50%). Four plant communities, i.e., *Prosopis spicigera – Capparis decidua, Prospopis spicigera, Corchorus antichorus – Aerva tomentosa, Rhazya stricta – Haloxylon griffithi* and *Suaeda fruticosa – Salvadora persica – Tamarix articulata* have intermediate frequency (25–50%) of occurence of termite nests, while remaining six communities have very low values of (< 25%) of frequency of occurrence of termite nests.

Infested Area

Five plant communities viz., *Crotolaria burhia-Capparis decidua, Prosopis glandulosa – Suaeda fruticosa, Prosopis spicigera – Corchorus antichorus – Aerva tomentosa, Salsola foetida – Panicum repens* and *Suaeda fruticosa – Salvadora persica* have high termite infested area (115m^2/ha). Two plant communities (*Cyperus rotundus – Tamarix articulata* and *Prosopis spicigera – Capparis decidua*) have intermediate termite infested area (46–115m^2/ha) and five plant communities, i.e., *Cynodon dactylon – Prosopis spicigera, Haloxylon griffithi, Rhazya stricta – Haloxyolon griffithi, Suaeda fruticosa* and *Tamarix dioica – Tamarix gallica* have termite nest infested area (46m^2/ha). (Table 1).

Discussion

Termite nest density, frequency and extent of termite infested are found to vary from community to community (Table, 1). Wood and Lee (1971) have reported termite mound density in the range of 2.4–11.8/ha from various vegetation types of Australia. These variations are mainly due to the nature and availability of vegetative material in these communities. The plant material is a basic diet of termites. Termites have choice of different plant species and their parts (Bouillon, 1970). Physical and chemical soil characteristics of these communities can also be held responsible for these variations. Kayani (1984) has reported that soil of these communities show marked variations in their texture, salinity and sodicity levels. Termites have a definite preference for particular soil textural class for their next building (Ratcliffe et al 1952; Harris 1955; Claby and Gay 1956; Lee and Wood 1971). Kayani and Sheikh (1981, 1984) have reported a marked decrease in the number of termite species and genera with an increase in soil salinity and sodicity.

Data regarding termite frequency in various communities (Table, 1) shows that in most

of the plant communities recognized in the present work, frequency of occurrence of termite nests is relatively low (< 50%) only two plant communities i.e., *Crotolaria burhia – Capparis decidua* and *Prosopis glandulosa – Suaeda fruticosa* have relatively high frequency of termite nest occurrence (> 50%). Bodot (1964) has reported frequency of occurrence of subterranean nests in the range of 20–80% in different types of Savana in the Ivory Coast, West Africa.

From the present study it can be safely stated that variations in termite density, frequency and degree of infestation in various communities is most probably due to variations in nature and composition of vegetation and soil characteristics, particularly texture, salinity and sodicity levels.

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Table 1

Distribution of Termite nests in various community types of Eastern Baluchistan

Name of Community*	Total No. of Nests	Density of nest/acre	Frequency of Nest	Total Infested area feet	Infested area feet/acre
Crotolaria burhia-Capparis decidua	35	114.6	63.3	475	1917
Cynodon dactylon-Prosopis spicigera	1	4.03	4	1	4
Cyperus rotundus-Tamarix articulata	7	28.23	16.6	72	290
Desmostachya bipinnata-Artemisia maritima-Aliagnus baluchistanica	–	–	–	–	–
Forsskalea tenacissima	–	–	–	–	–
Haloxylon griffithi	7	28.2	6.6	6.5	97
Panicum repens	–	–	–	–	–
Panicum repens-Tamarix articulata	–	–	–	–	–
Prosopis spicigera-Desmostachya bipinnata	–	–	–	–	–
Prosopis glandulosa-Suaeda fruticosa	30	112	66.6	242	980.0
Prosopis spicigera-Capparis decidua	8	32	30	60	244
Prosopis spicigera-Corchorus antichorus Erva tomentosa	17	68.5	40	172.2	693
Rhazya stricta-Haloxylon griffithi	14	56.4	46.6	273	114
Salsola foetida-Panicum repens	4	16.13	15	152	616
Suaeda fruticosa	4	16.13	13.3	24	97
Suaeda fruticosa-Salvadora persica	19	72.6	36.6	421	1697
Tamarix articulata-Desmostachya bipinnata	–	–	–	–	–
Tamarix dioica-Tamarix gallica	1	4.03	3.3	1.6	6.4
Tamarix articulata	–	–	–	–	–

* As recognized by Kayani 1984.