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Sex ratio and population of *Abgrallaspis narainus* (dutta and singh) (homoptera: diapididae) in urban and rural area

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Abstract
An Armored Scale *Abgrallaspis narainus* (Dutta & Singh) is describe. This species infest many ornamental, Agriculture, Horticulture plants and economical trees. *Abgrallaspis narainus* (Dutta & singh) is a serious pest of *Dalbergia sissoo*, *Musa paradisiaca*, *Carica papaya*, etc. It causes leaf blad disease on host plant.
Population study have been observed on *Dalbergia sissoo* counting was done by sampling method which was describe by Mc clure (1977). Minimum population of *Abgrallaspis narainus* in rural area is 1:1.10 and Maximum in urban area 1: 1.12. This difference of population in rural and urban areas may be accounted for increasing population in the urban localities.
Seasonal variations have been observed in winter (Jan & Feb) and Minimum population is observed in leaf fall seasons.

Keywords: armored scale, pest, taxonomy, invasive species, diapsididae

1. Introduction
The *Abgrallaspis narainus* (Dutta & Singh) armored scale infest many ornamental, agriculture, horticulture plants and economical tree. The armored scale insect *Abgrallaspis narainus* (Dutta & singh) belongs to order Homoptera Superfamily Coccoidea, family Diapsidae, Subfamily Aspidiotina, tribe Aspidiotini, Subtribe Aspidiotina. These insect are minute, inconspicuoues highly specialized and found in every corner of the world. These insect infest leaves, stem, twigs, fruits,and bark of host plants and trees.
Abgrallaspis narainus (Dutta & Singh) is polyphagous infesting a variety of plants and trees like *Dalbergia sissoo*, *Mangifera indica*, *Carica papaya*, *Musa paradisiaca* etc. This species is every merous which infests mainly both the dorsal and ventral surface of the leaves and sucks the plant sap. It causes leaf blad disease on host plant.

Material and Method
The material included individuals of both the sexes adults. Specimens were preserved in dry or 70% ethyl alcohol. the permanent slide have been prepared by the method (Williams & Koszharb1970)
Total population (living eggs and all development stages including male and female was conducted by sampling method of Me clure (1977 - 1982)) in following manner.
The trees were choosen on the random basis, four branches were removed from each direction and at different heights. Counting was done by sampling method which describe by Mc clure (1977) with the help of formula:

$$M = \sum FX / N$$

Where M = Mean
∑= Sum
F = Frequency
X= Value of separate items in definite difference
N= Number of experiments

A consolidated graph has been drown which depicts total population of male and female in both rural and urban areas the infestation is maximum during the months of January and February where as it is minimum during March and April. Overall population observation shows that infestation was more severe damage in the urban area than the rural area.

Discription
The minimum population of *Abgrallaspis narainus* is rural area is 1: 1.10 and in urban area 1:1.12. This difference of population is rural and urban area may be accounted for increasing population in the urban localities. Seasonal variations have been observed in the population of *Abgrallaspis narainus* both in rural and urban areas. The minimum population has been observed during leaf fall season while maximum population has been observed during the winter season.
The sex ratio of *Abgrallaspis narainus* during 12 months observation where found to be 1: 1.10 during the month of March and in urban area found to be 1: 1.12 during the month of March. The maximum sex ratio in rural and urban areas was observed to be 1: 2.73 in February and 1; n2.45 in December respectively.
The infestation of *Abgrallaspis narainus* (Dutta & Singh) primarily occur on the leaves of *Dalbergia sissoo* infestation on shoots in negligiable evidence support that the infestation occurs in soft parts of host trees the feeding of all stages of the life cause cheorotic spots in the form of yellowish- white patches. The size of the depends upon the stage which causes it. Developing stage result into small patches, white adult female form large patches. The severity of the injury to the leaf blade is proportional to number of the insect's feeding on it. When the insects memories leaves become shrink with great chloroses.

Result & Discussion
The A Narainus is small, oval and flat with protective tan shell like waxing (scale). It generally targets the leafs. Armored scales

are more difficult to control once they get mature. Leaves turn yellow and they drop from the plant. A Narainus are more population is controlled by the rate of development & number of generations per year. Climatic conditions particularly temperature humidity and rain fall. Leaf fall appears to be principal controlling factor.

Melis 1951 observed low temperature as the retarded factor.

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Table 1: Sex ratio of *Abgrallaspis narainus* in the rural area during different months of the year 2008-2009

S. No.	Months	Days	Male	Female	Sex ratio
1.	January	1st 15 Days	634	1582	1 : 2.49
		Last 15 Days	648	1674	1 : 2.58
2.	February	1st 15 Days	678	1792	1 : 2.64
		Last 15 Days	692	1896	1 : 2.73
3.	March	1st 15 Days	412	454	1 : 1.10
		Last 15 Days	396	462	1 : 1.16
4.	April	1st 15 Days	394	518	1 : 1.31
		Last 15 Days	384	546	1 : 1.42
5.	May	1st 15 Days	402	654	1 : 1.62
		Last 15 Days	418	692	1 : 1.65
6.	June	1st 15 Days	428	698	1 : 1.63
		Last 15 Days	436	752	1 : 1.72
7.	July	1st 15 Days	446	786	1 : 1.76
		Last 15 Days	458	822	1 : 1.79
8.	August	1st 15 Days	472	880	1 : 1.86
		Last 15 Days	490	908	1 : 1.85
9.	September	1st 15 Days	508	962	1 : 1.89
		Last 15 Days	514	988	1 : 1.92
10.	October	1st 15 Days	528	1074	1 : 2.03
		Last 15 Days	536	1120	1 : 2.08
11.	November	1st 15 Days	552	1186	1 : 2.14
		Last 15 Days	568	1244	1 : 2.19
12.	December	1st 15 Days	594	1364	1 : 2.29
		Last 15 Days	612	1472	1 : 2.40
Average Population			12200	24526	1 : 2.01

Table 2: Sex ratio of *Abgrallaspis narainus* in the urban area during different months of the year 2008-2009

S. No	Months	Days	Male	Female	Sex ratio
1.	January	1st 15 Days	1192	2390	1 : 2.00
		Last 15 Days	1198	2448	1 : 2.04
2.	February	1st 15 Days	1202	2468	1 : 2.05
		Last 15 Days	1214	2596	1 : 2.13
3.	March	1st 15 Days	578	652	1 : 1.12
		Last 15 Days	586	692	1 : 1.18
4.	April	1st 15 Days	642	880	1 : 1.37
		Last 15 Days	612	892	1 : 1.45
5.	May	1st 15 Days	832	1130	1 : 1.35
		Last 15 Days	912	1442	1 : 1.58
6.	June	1st 15 Days	844	1260	1 : 1.49
		Last 15 Days	922	1492	1 : 1.61
7.	July	1st 15 Days	852	1422	1 : 1.66
		Last 15 Days	928	1586	1 : 1.70
8.	August	1st 15 Days	864	1528	1 : 1.76
		Last 15 Days	932	1680	1 : 1.80
9.	September	1st 15 Days	868	1632	1 : 1.88
		Last 15 Days	934	1780	1 : 1.90
10.	October	1st 15 Days	836	1840	1 : 2.96
		Last 15 Days	942	1868	1 : 2.98
11.	November	1st 15 Days	948	1912	1 : 2.01
		Last 15 Days	954	2092	1 : 2.19
12.	December	1st 15 Days	966	2232	1 : 2.31
		Last 15 Days	972	2386	1 : 2.45
Average Population			21826	40300	1 : 1.84

Table 3: Season wise sex ratio and population of *Abgrallaspis narainus* in the urban area

S. No	Season	Population		Total Population	Sex Ratio
		Male	Female		
1	Summer (May-June) 2 Months	3510	5324	8834	1: 1.51
2	Rainy (July-October) 4 Months	7256	13336	20592	1:1.83
3	Winter (November- February) 4Months	8646	18524	27170	1:2.14
4	Leaf Fall (March- April) 2 Months	2418	3116	5534	1:1.28

Table 4: Season wise sex ratio and population of *Abgrallaspis narainus* in the rural area

S. No	Season	Population		Total Population	Sex Ratio
		Male	Female		
1	Summer (May-June) 2 Months	1684	2796	4480	1: 1.66
2	Rainy (July-October) 4 Months	3952	7540	11492	1:1.90
3	Winter (November- February) 4Months	4978	12210	17188	1:2.45
4	Leaf Fall (March- April) 2 Months	1586	1980	3566	1:1.24
Grand total		12200	24526	36726	1:2.01

Conclusion

A Narainus inhabits up to 100 or 121 host plants in India and causes economical Damage. Some of the host plants that have been identified are prevent, *Dalbergia sissoo*, *Carica papaya*, Musa paradicica, *Mangifera indica* ect. Thousands of rupees are spent on the control of this pest as infestation can become significant. it effects leafs, steam, bark, swings of Dalbargia sisoo : so *Dalbergia sissoo* wood is used for making furniture and Papaya is a fruit which as great economic value.

Seasonal variation in the population has also been observed in case of *Abgrallaspis narainus*.

Minimum population has been observed during leaf fall season & maximum during winter season in both in rural and urban areas. This may be due to best suitable climate condition during winter season. During the period of summer season also reduce population but gradually increasing during the rainy season (from July to October).

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