Dongargaon (near Pisdura in Maharashtra) sediments, which are now known for dinosaurs[16], contain fish fauna of 'Danian Cretaceous to Upper Eocene'[14] (Danian is regarded as Lower Palaeocene). Therefore, if we are to rely on the work of Woodward, the survival of dinosaurs into the Tertiary can be accepted. It is immaterial whether the Dongargaon sediments are infra-trappean or inter-trappean, a controversy which still exists and will continue to exist, because of the nature of the exposures in the area. In either case, the idea of the survival of dinosaurs into the Tertiary will not be threatened.

There is yet another evidence put forward recently which supports the contention that dinosaurs had seen the dawn of Tertiary in India. It comes from the angiospermic seeds of the family Boraginaceae recovered from the dinosaur egg-bearing sediments of Balasinor area, Kheda District, Gujarat, suggesting Palaeocene age for the sediments[16].

While, interpreting the Indian fauna in relation to the Indian Plate movement, Van Valen and Sloan[3] had opined 'late Cretaceous dinosaur fauna of India survived through the Palaeocene into the Eocene'. Evidences of the same are slowly, but surely, trickling in. It is believed that further search of dinosaur localities and horizons will strengthen the view of the survival of dinosaurs to the Tertiary.

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ANTIFEEDANT ACTIVITY OF PLANT EXTRACTS AGAINST *SPILOSOMA OBLIQUA* WALKER

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PHYTOCHEMICALS play a major role in the host plant selection process of phytophagous insects[1]. Secondary metabolites of plant origin which deter feeding could be useful for the management of insect pests in the same manner as other agricultural chemicals. A number of reports on antifeedant activity from plants are available in the literature[2–8].

Under our screening programme of flora for antifeedant activity, several plant extracts have been evaluated for antifeedant activity against the Bihar hairy caterpillar, *Spilosoma obliqua*. In this paper, we report the antifeedant property in 26 plants of various families.

The plants listed in table 1 were collected from local flora, shade-dried and powdered. Extraction was done by Soxhlet apparatus using acetone as solvent[9]. Some of the plant extracts were obtained from CDRI, Lucknow. All extracts were dissolved in acetone and the desired concentrations made. Laboratory-bred insect cultures of *S. obliqua* were used for the experiments. Castor leaf bits were cut to uniform size and the leaf area was measured by Li-Cor electronic area measurer (M/s Li-Cor, Ltd., USA). Measured leaf bits were dipped in test solutions for 2 sec and air-dried Each treatment was replicated thrice. Two third instar larvae starved for 6 hr, were released in each petri dish (150 mm × 20 mm) having moist blotting paper and treated leaf bits. After 48 hr, the leaf area of the

Table 1 *Antifeedant activity of plant extracts against Spilosoma obliqua Walker*

Plant Name	Family	Mean per cent consumed	Per cent protection over control
Argyreia nellygherya Choisy.	Convolvulaceae	54 87 (47.97)	27.86
Crotalaria vestita Baker.	Leguminosae	40.11 (39.00)	47.27
Erinocarpus nimmonii Grahm.	Tiliaceae	43.08 (40.88)	43.36
Eriobotrya bengalensis Hkf.	Rosaceae	41.45 (39.94)	45.50
Ehretia canarensis Miq.	Boraginaceae	20.89 (32.01)	60.70
Farsetia hamiltonii Royle	Cruciferae	47.46 (43.46)	36 60
Ficus hirta Vahl.	Moraceae	65.37 (53.93)	14.05
F. rostrata Lam.	Moraceae	56.09 (48.58)	26.26
Hedychium gracillimum Koenig.	Zingiberaceae	67.44 (55.19)	11.33
Ilex denticulata Wall.	Aquifoliaceae	75.45 (60.28)	0.08
I. wightiana Wall.	Aquifoliaceae	58.34 (49.82)	23.30
Lindenbergia grandiflora Benth.	Scrophulariaceae	13.12 (21.05)	82.75
Leucos prostrata Hook. f. and Gamble	Lamiaceae	68.92 (56.10)	9.39
Luculia pinceana Hook.	Rubiaceae	73.65 (63.53)	3.17
Melodinus khasianus Hkf.	Apocyanaceae	59.98 (51.70)	21.67
Passiflora mollissima HBK.	Passifloraceae	21.42 (27.20)	71.84
Pavetta siphonantha Dalz.	Rubiaceae	38.31 (38.20)	49.63
Rapanea wightiana Mey.	Myrsine	42.48 (40.43)	44.15
Rheum emodi Wall.	Polygonaceae	48.83 (43.52)	35 80
Schima khasiana Dyer.	Ternstroemiaceae	29.58 (39.10)	61.11
Solanum capsicoides Hort.	Solanaceae	65.06 (53.76)	14.66
Symplocos foliosa Wight.	Symplocaceae	67.29 (54.94)	11.53
Terminalia chebula Retz.	Combretaceae	37.36 (37.55)	50.88
Vaccinium mernularis Hook	Vacciniaceae	65.56 (54.05)	13.80
Viburnum nervosum D. Don	Caprifoliaceae	63.15 (52.63)	16.97
Zizyphus rugosa Lam.	Rhamnaceae	60.34 (51.42)	20.55
Control Acetone		76.06 (60.72)	
C.D. at 5% level		(17.75)	
S.E.M. at 5% level		8.78	

Figures in parantheses are angular values; In all the plants the extract was acetone. The dosage was 2% in all cases except in *T. chebula* Retz. where it was 1%.

leftover bits was measured. The experiment was conducted at an average temperature of $21 \pm 2°C$ and a relative humidity of $48 \pm 5\%$.

The data were subjected to statistical analysis for the per cent feeding and per cent protection over control[10-11]

Table 1 shows that of 26 plant extracts tested, antifeedant activity was the highest in *Lindenbergia grandiflora* Benth. followed by *Passiflora mollissima* HBK which gave 82.75 and 71.84% protection over control, respectively, while moderate antifeedant activity was found in *Schima khasiana* Dyer and *Ehretia canarensis* Miq. which gave 61.11 and 60.70% protection over control, respectively. In other plant extracts per cent protection ranged from 0.08 to 50.88%.

Antifeedant property was reported in *Solanum khasianum* and *S. indicum* seed oil against *Tribolium castaneum*[12], while in our results acetone extract of *Solanum capsicoides* gave antifeedant activity 14.46% only. Benzene extract of *Ficus carcia* gave 70% activity against *Spodoptera litura* F.[5], but in the present experiment acetone extract of *Ficus rostrata* and *F. hirta* gave 26.26 and 14.05% protection, respectively.

Further fractionation of plants having potent antifeedant activity and isolation of active constituents is being carried out.

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DECOMPOSITION OF SUGARCANE BAGASSE BY THE BIRD'S NEST FUNGUS *CYATHUS*

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SUGARCANE bagasse represents a major agricultural byproduct whose cumulative deposition is a health hazard and causes an allergy termed "bagassosis". Major uses of bagasse include structural and acoustical wall boards, synthetic resins and light weight concrete and use as fuel[1]. Further microbial processing yields a variety of products chiefly alcohol and single cell protein[2,3]. This is impeded by the fact that lignocellulose is not easily amenable to decomposition. But it is established that nearly 70–80% of the residual plant material in the natural ecosystem is decomposed by the basidiomycetous fungi[4,5]. In earlier study with *Cyathus* on paddy straw yielded positive substrate decomposition[6]. It was therefore, considered worthwhile to explore the decomposition of bagasse by the species of *Cyathus*.

Cultures of *C. helenae* type (Brodie 1500), *C. helenae* Dick (Brodie 1500) and *C. striatus* (Nuds) wild ex. Press (Brodie 1500) were obtained from the National Collection of Fungal Cultures, Ottawa, Canada. *Cyathus* sp. was isolated from decaying mango wood collected locally. All cultures were maintained on Brodies agar slants[6].

Fermentation of bagasse was carried out at 28°C using 2 g dry powder in 50 ml Brodies broth (devoid of maltose, dextrose and glycerine) dispensed in 250 ml Erlenmeyer flasks. After autoclaving the contents of the flasks at 15 lb. sq. in. for 20 min, each were inoculated with three fungus-bearing discs (8 mm diam) taken from growing cultures of appropriate isolate on Brodie's agar; the normal broth and uninoculated bagasse media served as control. At suitable intervals, fermented residue with mycelial

Table 1 *Release of cellulase by species of Cyathus in a medium containing sugarcane bagasse*

Organism	*Cyathus sp.*		*Cyathus striatus*		*Cyathus helenae* Type		*Cyathus helenae* Dick	
	Incubation period (days)							
	50	62	50	62	50	62	50	62
CM cellulase								
EA	6.22	5.42	5.06	5.33	5.64	4.83	3.83	4.68
SEA	2.30	2.17	2.20	1.98	2.68	2.19	2.18	2.03
FP cellulase								
EA	1.11	1.81	0.94	0.78	1.64	1.11	1.47	1.89
SEA	0.41	0.72	0.41	0.29	0.78	0.51	0.34	0.82
Cotton activity								
EA	2.35	1.93	1.86	2.53	2.61	2.50	1.93	3.08
SEA	0.87	0.77	0.81	0.94	1.24	1.14	1.09	1.34

EA – enzyme activity, expressed as the release of 1 μmol of reducing sugar (as glucose) ml^{-1} hr^{-1}; SEA – specific enzyme activity, expressed as enzyme units per mg protein; values represent mean of atleast two replicates.