Classification of SILKWORMS

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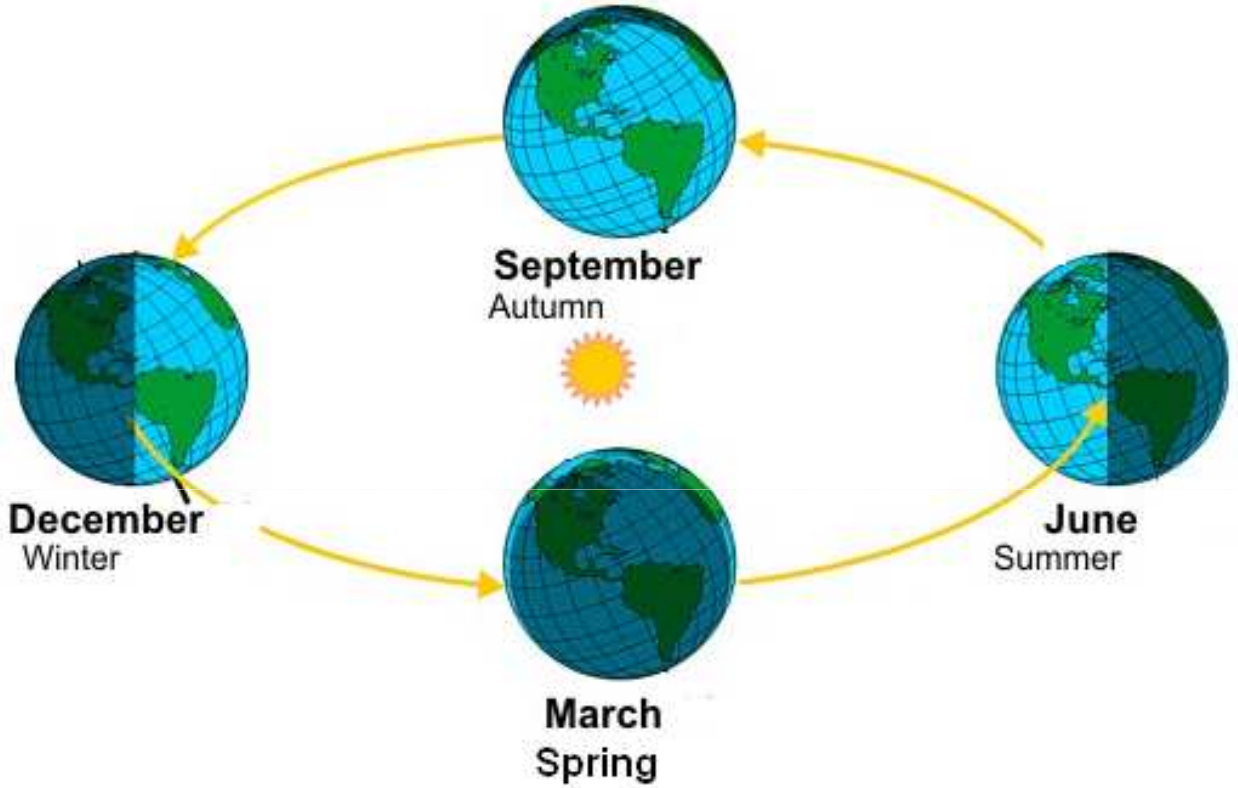
CLASSIFICATION OF SILKWORMS BASED ON VOLTINISM

Voltinism is a term used in biology to indicate the number of broods or generations of an organism in a year. / Number of generations per year under natural environmental conditions.

- **UNIVOLTINES**
- **BIVOLTINES**
- **MULTIVOLTINES**
- **Semivoltine - Referring to organisms whose generation time is more than one year**

SEASONS OF TEMPERATE ZONE



Natural Uni and Bivoltines are available only in this zone

Univoltines completes their life cycle during spring season (Only ONE)

Bivoltines complete their first life cycle during spring and second life cycle during early summer

UNIVOLTINES

- **ONE generation/year**
- **Larval weight is comparatively higher, cocoons are heavy**
- **Denier is above 2.3**
- **Not suitable for summer & winter rearing**
- **They lay only Diapausing eggs**
- **All European races are univoltines *eg.*, E16**

BIVOLTINES

- **They produce TWO generations/year**
- **The larval duration is short to that of Univoltines**
- **The leaf cocoon ratio is less**
- **The quality of the cocoons inferior to that of Univoltine races**
- **Cocoon weight, shell weight, silk % & filament length lesser than univoltines**
- **Most of the temperate races are bivoltines and lays both hibernating and non hibernating eggs *eg.*, NB_4D_2, NB_{18}, KA, NB_7 *etc.*,**

MULTIVOLTINES

- **They produce more than 5-6 generations/year.**
- **The larval duration is short.**
- **The leaf cocoon ratio is high.**
- **Cocoons are compact grained and soft.**
- **The filament length is short.**
- **The filament is fine and clean with little lousiness; but with more lustrous.**
- **The larvae are robust and can tolerate fluctuating environmental conditions.**
- **They lay only non diapausing eggs. *Eg.*, Pure Mysore, C. nichi, Hosa Mysore.**

CLASSIFICATION BASED ON MOULTINISM

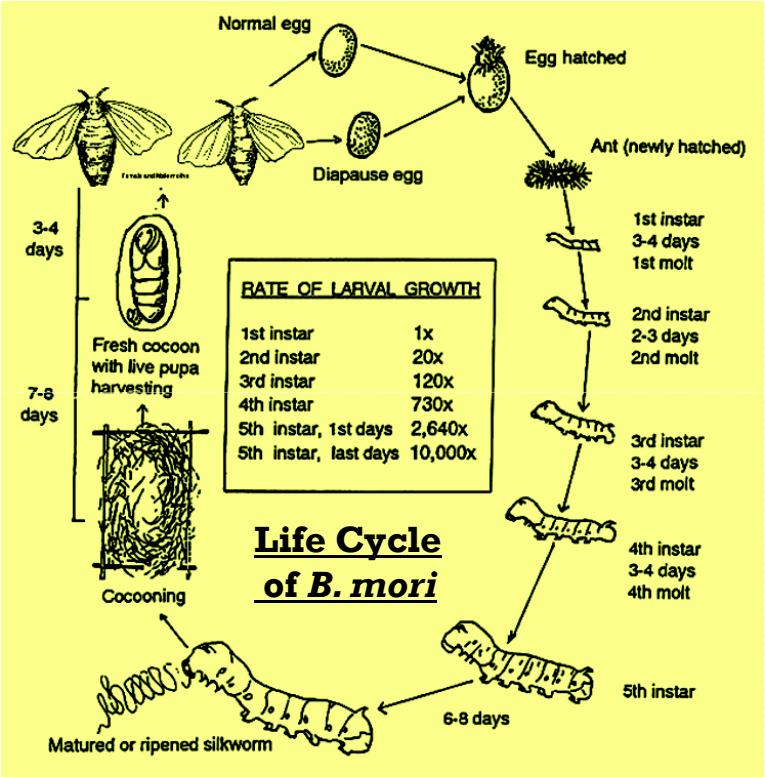
Moulting - Moulting or molting, also known as shedding, or ecdysis, is the manner in which an animal routinely casts off an outer layer or covering at specific points in its life cycle.

Silkworm Larva crawling out of its outer old layer of skin

CLASSIFICATION BASED ON MOULTINISM continued

Based on numberof moults silkworms can be classified as

- **Tri moulters**
- **Tetra moulters**
- **Penta moulters**
- **Hexa moulters - Very rare**



TRIMOULTERS

- **This group includes silkworms which moults three times during larval period.**
- **The larval growth is limited, the larval duration short ranging from 15-18 days.**
- **Pupae & moths are small, cocoon weight is less, cocoon filament is fine & denier is 1.7.**

TETRAMOULTERS

- **This group moults four times during their larval stage.**
- **The length of the larval stage is medium ranging from 23-28 days.**
- **The larval growth and cocoon weight is medium, denier is 2-2.5.**
- **Tetra moulters are cosmopolitan in their distribution.**

PENTAMOULTERS

- **Which moults five times during their larval stage.**
- **The length of the larval stage is long, larval weight is high and cocoons are heavy.**
- **Denier is very high.**

CLASSIFICATION BASED ON GEOGRAPHIC DISTRIBUTION

- **Japanese race (Aboriginal [indigenous] in Japan)**
- **Chinese race (Aboriginal in China)**
- **European races (Aboriginal in Europe and Central Asia)**
- **South east Asian races**

Japanese race (Aboriginal in Japan)

- **Fecundity is higher ranging from 600-700.**
- **The larvae is very active & leaf cocoon ratio is less.**
- **Larval body size is small for long larval duration (26d).**
- **The larvae are marked.**
- **The cocoon shape is pea nut / dumbell.**
- **Almost all races produce white cocoons.**
- **Double cocoon % is more & quality of silk is better.**
- **Larvae are susceptible to grasserie and flacherrie.**
- **Uni and Bivoltines races falls under this group**

Chinese race (Aboriginal in China)

- **Fecundity is higher.**
- **The larval growth is quick & leaf cocoon ratio is less.**
- **The larvae are plain.**
- **The shape of the cocoon is round/elliptical/few of them are spindle shaped.**
- **Cocoon colour is white. Silk filament is fine & reelability is good.**
- **Resistant to high temperature & humidity.**
- **Uni, Bi, Multivoltines falls under this group.**
- **Silkworms were reared in different localities in 2600 B.C.**

European races (Aboriginal in Europe and Central Asia)

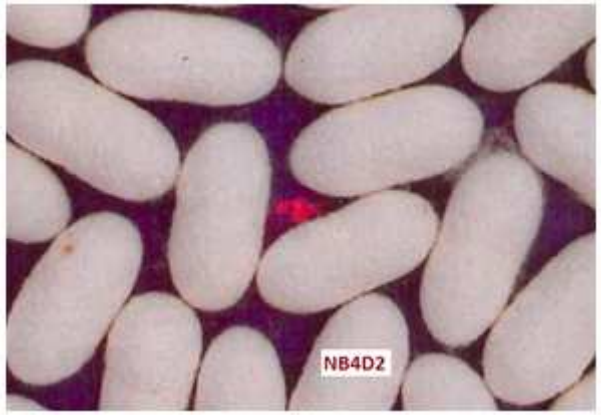
- **Fecundity is low, around 600 & size is large.**
- **The larval stage is long, moulting period reduced by 1-2 h.**
- **The larvae are plain.**
- **The cocoons are big & elongated. White/flesh coloured.**
- **The filament length is long with good reelability.**
- **The % of double cocoons less.**
- **Weak against high temperature & humidity.**
- **All are Univoltines.**

South east Asian races (Tropical)

- Fecundity is lower @ 400-500. Eggs are small.
- The larval length is short with few exceptions.
- The larval markings are not common.
- Leaf cocoon ratio is high.
- The shape of the cocoon is spindle, flossy, less filament.
- Cocoon colour is green/pink/yellow/white. Denier is fine.
- Resistant to high temperature & humidity.
- Multivoltines are very common.

Popular Silkworm Breeds of Karnataka

PM X CSR2



Popular Silkworm Breeds of Karnataka & their Economic Traits

Traits > / Breed↓	Fecundity No.	Hatching %	LD Hours	Cocoon shape & color	Cocoon wt. Gm	Shell Wt. Gm	Shell %	Denier
PM	473	96.13	689.22	Greenish yellow / oval	0.942	0.130	13.79	1.7
C.nichi	454	96.64	505.11	Dumb bell / white	1.077	0.121	11.32	1.6
NB_4D_2	558	95.34	609.55	Dumb bell / white	1.817	0.398	21.89	2.2
KA	540	94.9	600.00	Oval / white	1.62	0.3	18.63	2.1
CSR_2	550	97	600	Round oval/ White	1.8	0.36	20	2.1

Acknowledgements
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