



## RESEARCH PAPER

# A study on knowledge and adoption level of lac production among lac growers in Bastar district of Chhattisgarh

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**Abstract :** The present study is based on the primary data collected from 160 lac growers in Bastar district of Chhattisgarh during the year 2012-2013. The study revealed that practices like inoculation method of seed lac in host plants (38.75%) was recorded high level of knowledge, whereas respondents had medium level of knowledge about lac producing trees (81.87%) and low level of knowledge on lac strain (97.50%). In case of practice wise level of adoption, it was found that maximum number of respondents had high extent of adoption in selection of host plants (11.25%), followed by pruning of host plants (91.25%) under medium level of extent of adoption and it was found that cent per cent had low level of adoption regarding adoption of recommended strain. The knowledge and adoption level of lac growers can be increased through conducting training programmes on different aspects of lac production technology like processing, processing instruments, usages of lac in making by products by the concerned agencies and providing the facilities and proper guidance to the lac growers for adoption of recommended lac production technology which will be helpful in providing additional income to the lac growers. Results of the study will be helpful to improve the production scenario of lac which will be helpful for farmers to get additional income.

**Key Words :** Knowledge, Adoption, Lac growers

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## INTRODUCTION

Forest are the rich source of NTFP's (non-timber forest products) which gives direct or indirect income and livelihood option for the people who lives in and around forest area. The NTFP's major and minor forest produce like tamarind, tendu leaves, medicinal plants, honey, mushroom, lac and various other forest products provides direct or indirect additional income to the poor people, among them lac is the one of the major one. Lac

is a natural heritage of our country and associated with tribal people providing regular income in absence of other cash crops. It is a natural resin produced by a tiny insect scientifically called as *kerria lacca* Kerr. Lac is a protective covering of the insect which is secreted from the glands of insect. It is nature gift to mankind and non-injurious to health. There are about 9 species of lac insect are found in the world but in India only 2 species are cultivated for economic use *i.e* *laccifer* and

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*paratakadona*. Cultivation of lac is done by two methods *i.e* traditional and scientific. India has a great potential for lac culture and its production in various states like Chhattisgarh, Jharkhand, Madhya Pradesh, West Bengal, Uttar Pradesh, Maharashtra, Andhra Pradesh and Odhisa.

Chhattisgarh ranks first in the country in lac production with annual production of 9868 tons during 2013-14; Chhattisgarh contributes 49 per cent production of lac during year 2013-14 in total lac production in India (Anonymous, 2014). Bastar district is dominant with the forest area. Forest plays an important role in the lives of the people, providing food security and livelihood through the collection of minor forest produce and employment (as casual labour) in the forest department. Production of lac in Bastar district accounting of all four seasons *i.e.* aghani, jethwi, baisakhi and katki during year 2013-14 was 145 tons (Anonymous, 2014).

Lac helps the tribal people of Bastar in increasing their income, improving their social status and also a medium of livelihood option. It also acts as one of the least cost income generating activity for the farmers in cash without any risks of drought. The study conducted by Kumar *et al.* (2012) found that majority of the sericulturists (44.16%) had low knowledge about organic farming practices in sericulture whereas, 35.83 per cent were in medium level category. It was also found that only 20 per cent of sericulturists had high level of knowledge regarding organic farming practices. He also added that majority of the sericulturists (88.33%) had correct knowledge about application of FYM and use of Ankush (82.50%), whereas 42.50 per cent had correct knowledge on use of Harith and *Neem* seed kernal extract (30.83%). Narayanaswamy *et al.* (2005) observed that majority of the farmers had moderate knowledge about organic sericulture practices (54%) followed by low (30%) and high categories (16%). Geetha and Srinivasa (2007) observed that the farmers were having full knowledge of recommended technologies like silkworm spacing and shoot rearing. Pal (2009) revealed that the adoption percentage of improved techniques by trained lac-growers was 76.0 per cent for coupe system, 92.0 per cent for pruning of lac hosts, 86.0 per cent for selection of good quality broodlac, 84.0 per cent for bundling of broodlac and tagging on plant, 100 per cent for *phunki* (used up broodlac) removal, 54.0 per cent for spraying of insecticide, 38.0 per cent for use of synthetic net and 18.0 per cent for spray of fungicide. A

low adoption percentage was observed in the case of spraying of insecticides and fungicides and use of synthetic net due to non-availability of these inputs in the local and nearby markets. Pal *et al.* (2004) found that about 62.5 per cent lac growers were adopting pruning of lac host and 87.5 per cent were adopting *phunki* removal technique. In case of selection of good quality broodlac, bundling and crop inoculation were low and it was 28.0 and 42.0 per cent, respectively. Pal *et al.* (2009) indicated that the major constraints of the respondents were yield gap in lac cultivation, non availability of inputs in local market (90.00%), lack of scientific knowledge in lac cultivation (78.00%), shortage of funds for purchase of inputs (72.00%), insect mortality due to environmental factors (72.00%), operational difficulties due to host height (64.00%), theft of lac (54.00%), lack of grading facility in the market (53.00%), shortage of broodlac and lack of information on current price of lac (50.00%). Pal (2009) stated that the shortage of funds for purchase of inputs (specially broodlac), non-availability of inputs in local and nearby markets (pesticides and synthetic net bag), theft of lac, shortage of broodlac, insect death due to climatic change, lack of information on current price of lac, lack of scientific knowledge on lac cultivation, difficulty in cultivation operations due to host height, long distance of market, and lack of grading facility in the market were the major constraints faced by more than 50 per cent untrained lac-growers in lac cultivation. Pal (2009) suggested that there is a need for strengthening and widening the extension activity to empower the lac growers with scientific knowledge on lac cultivation so as to increase income and employment generation at the farm level. Pal *et al.* (2009) suggested that there is need for extensive transfer of technology programme and motivational activities for lac growers to adopt scientific methods of lac cultivation, development of lac producers in form of SHG's will be helpful for lac growers, need to strengthen marketing facility, farmers should get information of prices of lac through electronic and print media will be helpful to know the current prices of lac and farmers should be encouraged to plant trees hosts for lac cultivation on waste lands and bunds of agricultural field. Pal (2009) revealed that the adoption percentage of improved techniques by trained lac-growers was 76.0 per cent for coupe system, 92.0 per cent for pruning of lac hosts, 86.0 per cent for selection of good quality broodlac, 84.0 per cent for bundling of broodlac and

tagging on plant, 100.0 per cent for *phunki* (used up broodlac) removal, 54.0 per cent for spraying of insecticide, 38.0 per cent for use of synthetic net and 18.0 per cent for spray of fungicide. A low adoption percentage was observed in the case of spraying of insecticides and fungicides and use of synthetic net due to non-availability of these inputs in the local and nearby markets. Keeping all these above facts in mind the present study was undertaken to know the impact of knowledge of recommended lac production technology practices on the adoption on farmers in Bastar district of Chhattisgarh state.

## MATERIAL AND METHODS

The study was conducted in Bastar district of Chhattisgarh which holds a good record of lac production. A simple random sampling method was applied for selection of lac growers from different selected villages. Eight lac growing villages were selected purposively for present study. The details of lac growers were obtained by lac facilitator through forest department. Twenty lac growers were selected from each selected lac growing village. Thus, 160 lac growers were selected for survey in this study. The data and information have been obtained from lac growers through a pre-tested questionnaire survey method during the year 2012-2013. The knowledge and adoption questions covering various aspects of lac production technology were developed and asked to the respondents and the responses of respondents regarding knowledge and adoption of recommended lac production technology were obtained into three point continuum manner for both knowledge and adoption.

Categories	Score
No knowledge	1
Partial knowledge	2
Complete knowledge	3

Categories	Score
Not adopted	1
Partially adopted	2
Fully adopted	3

## RESULTS AND DISCUSSION

The data containing information about knowledge and adoption level of lac growers are presented in Table

1 and Table 2.

The data presented in Table 1 reveal that majority of the farmers had low level of knowledge regarding selected practices of lac production technology like knowledge of lac strain (97.50%) followed by, processing instruments used for lac (96.25%), usages of lac to prepare various by-products (94.38%), processing of lac (92.50%), theft of lac and their control measures (88.12%), places to sell lac (81.88%), knowledge about crop cycle (81.25%), knowledge about coupe cultivation (78.12%), removal of *phunki* lac from host plants (64.37%), selection procedure of seed lac (62.50%), knowledge about *phunki* lac and knowledge about seed lac (56.88%) and diseases and their control measures (55.62%)

It was found that majority of the respondents had medium level of knowledge regarding selection practices of lac production technology like knowledge of lac host plants (81.87%) followed by, method of pruning of host plants (74.38%), proper packaging of lac (71.25%), proper storage of lac and suitable place and temperature (69.38%), basis of selection of host plants for lac cultivation (66.87%), scrapping of lac after harvesting and pruning of host plants in proper time (63.75%), harmful insects and their control measures (57.50%), recommended quantity of seed lac used for inoculation (55.62%), harmful rodents, animals and their control measures (55.00%), time of harvesting of lac (54.37%), knowledge of instruments used for pruning (54.38%), knowledge of sources of seed lac (53.13%), knowledge about selection of place for lac cultivation (53.12%), time of inoculation of seed lac in host plants (52.50%) and inoculation method of seed lac in host plants (51.88%).

With respect to high level of knowledge it was seen that, majority of the respondents had high level of knowledge regarding selection practices of lac production technology like inoculation method of seed lac in host plants (38.75%) followed by, scrapping of lac from branches (23.75%), inoculation materials used for seed lac (17.50%), period of spreading of seed lac in host plants (15.62%), proper packaging of lac (14.38%), time of harvesting of lac from host plants and basis of selection of host plants for lac cultivation (13.75%), knowledge of lac host plants (13.13%) and method of pruning of host plants (11.88%).

It is very implicit from the data displayed at Table 2 that cent per cent of the respondents have low level of adoption regarding selected practices of recommended

lac production technology like adoption of recommended strain, adoption of host plants according to strain, theft and their control measures, processing of lac, processing instruments used for lac and usages of lac in making by products followed by, adoption of crop cycle (71.88%), places to sell lac (66.25%), selection of seed lac (64.38%), removal of *phunki* lac and diseases and their control measures (61.25%), identification of *phunki* lac (60.63%), rodents, animals and their control measures (60.00%) and inoculation of seed lac at proper time (50.00%).

In case of medium level of adoption category it was found that majority of the respondents (91.25%) had

adopted pruning of host plants followed by, proper packaging of lac (75.00%), storage of lac at suitable place and temperature, selection of host plants (72.50%), pruning instruments (69.38%), scraping of lac after harvesting (68.75%), insects and their control measures (64.37%), time of pruning of host plants (61.87%), time of harvesting of lac from host plants (52.50%), seed lac quantity (51.25%) and materials required for inoculation of seed lac (50.63%). The probable reasons for medium level of adoption may be due to lack of detailed and in depth knowledge about lac production technology. There is a need to modify the attitude of the respondents through

**Table 1 : Distribution of respondents according to their practice wise knowledge level regarding recommended lac production technology (n=160)**

Sr. No.	Recommended lac production technology	Level of knowledge		
		Low	Medium	High
1.	Knowledge of lac host plants	08 (05.00)	131 (81.87)	21 (13.13)
2.	Knowledge of lac strain	156 (97.50)	03 (1.88)	01 (0.62)
3.	Knowledge of lac crop cycle	130 (81.25)	29 (18.13)	01 (0.62)
4.	Knowledge on coupe system	125 (78.12)	31 (19.38)	04 (2.50)
5.	Knowledge about selection of place for lac cultivation	64 (40.00)	85 (53.12)	11 (6.88)
6.	Selection of host plants for lac cultivation	31 (19.38)	107 (66.87)	22 (13.75)
7.	Pruning of host plants	48 (30.00)	102 (63.75)	10 (6.25)
8.	Pruning method of host plants	22 (13.75)	119 (74.38)	19 (11.88)
9.	Knowledge on instruments used for pruning	60 (37.50)	87 (54.38)	13 (8.12)
10.	Knowledge on brood lac	91 (56.88)	63 (39.37)	06 (3.75)
11.	Selection procedure of brood lac	100 (62.50)	57 (35.62)	03 (1.88)
12.	Knowledge of sources of brood lac	69 (43.12)	85 (53.13)	06 (3.75)
13.	Inoculation method of brood lac in host plants	15 (9.37)	83 (51.88)	62 (38.75)
14.	Time of inoculation of brood lac in host plants	61 (38.12)	84 (52.50)	15 (9.38)
15.	Quantity of brood lac for inoculation	59 (36.88)	89 (55.62)	12 (7.50)
16.	Period of spreading of lac insect from brood lac in host plants	68 (42.50)	67 (41.88)	25 (15.62)
17.	Knowledge about <i>phunki</i> lac	91 (56.88)	63 (39.37)	06 (3.75)
18.	Removal of <i>phunki</i> lac from host plants	103 (64.37)	50 (31.25)	07 (4.38)
19.	Harmful rodents, animals and their control measures	71 (44.38)	88 (55.00)	01 (0.62)
20.	Harmful insects and their control measures	66 (41.25)	92 (57.50)	02 (1.25)
21.	Diseases and their control measures	89 (55.62)	70 (43.76)	01 (0.62)
22.	control measures on theft of lac	141 (88.12)	12 (7.51)	07 (4.37)
23.	Time of harvesting of lac	51 (31.88)	87 (54.37)	22 (13.75)
24.	Scrapping of lac from branches	20 (12.50)	102 (63.75)	38 (23.75)
25.	Proper packaging of lac	23 (14.37)	114 (71.25)	23 (14.38)
26.	Proper storage of lac with suitable place and temperature	44 (27.50)	111 (69.38)	05 (3.12)
27.	Processing of lac	148 (92.50)	12 (7.50)	00 (00.00)
28.	Processing instruments used for lac	154 (96.25)	06 (3.75)	00 (00.00)
29.	Places to sell lac	131 (81.88)	29 (18.12)	00 (00.00)
30.	Usages of lac to prepare various products	151 (94.38)	09 (5.63)	00 (00.00)

Figure in parentheses shows percentage of farmers

proper guidance, persuasion and conducting skill demonstrations on different aspects of lac production technology on farmer's field to show their effectiveness in more production of lac.

In case of high level extent of adoption it was reported that majority of the respondents have high level of adoption in selected practices of lac production technology like selection of host plants (11.25%) followed by selection of place (10.63%), scraping of lac after harvesting and pruning instruments (9.37%), pruning of host plants and proper packaging of lac (6.25%) and materials required for inoculation of seed lac (5.62%).

**Conclusion :**

The findings of the study reveal that 38.75 per cent

of the respondents had high level of knowledge in practices like inoculation method of seed lac in host plants followed by scrapping of lac from branches (23.75%), inoculation materials used for seed lac (17.50%), period of spreading of seed lac in host plants (15.62%) and proper packaging of lac (14.38%). Around 81.87 per cent farmers had knowledge about lac producing trees followed by pruning of host plants (74.38%), proper packaging of lac (71.25%), proper storage of lac at suitable temperature (69.38%), basis of selection of host plants (66.87%), pruning of host plants and scrapping of lac after harvesting (63.75%), rodents, animals and their control and their control measures (55.00%). In case of low level of knowledge around 97.50 per cent farmers had knowledge about lac strain followed by processing

**Table 2 : Distribution of respondents according to adoption level of recommended lac production technology (n=160)**

Sr. No.	Recommended lac production technology	Level of adoption		
		Low	Medium	High
1.	Adoption of recommended strain	160 (100.00)	00 (00.00)	00 (00.00)
2.	Adoption of host plants according to strain	160 (100.00)	00 (00.00)	00 (00.00)
3.	Adoption of crop cycle	115 (71.88)	45 (28.12)	00 (00.00)
4.	Selection of place	69 (43.12)	74 (46.25)	17 (10.63)
5.	Coupe cultivation	140 (87.50)	17 (10.63)	03 (1.87)
6.	Selection of host plants	26 (16.25)	116 (72.50)	18 (11.25)
7.	Pruning of host plants	04 (2.50)	146 (91.25)	10 (6.25)
8.	Time of pruning of host plants	57 (35.63)	99 (61.87)	04 (2.50)
9.	Pruning instruments	34 (21.25)	111 (69.38)	15 (9.37)
10.	Selection of seed lac	103 (64.38)	55 (34.37)	02 (1.25)
11.	Inoculation of seed lac in host plants	77 (48.12)	78 (48.76)	05 (3.12)
12.	Materials required for inoculation of seed lac	70 (43.75)	81 (50.63)	09 (5.62)
13.	Seed lac quantity	75 (46.87)	82 (51.25)	03 (1.88)
14.	Inoculation of seed lac at proper time	80 (50.00)	77 (48.12)	03 (1.88)
15.	Identification of <i>phunki</i> lac	97 (60.63)	61 (38.12)	02 (1.25)
16.	Removal of <i>phunki</i> lac	98 (61.25)	60 (37.50)	02 (1.25)
17.	Rodents, animals and their control measures	96 (60.00)	64 (40.00)	00 (00.00)
18.	Insects and their control measures	57 (35.63)	103 (64.37)	00 (00.00)
19.	Diseases and their control measures	98 (61.25)	62 (38.75)	00 (00.00)
20.	Theft and their control measures	160 (100.00)	00 (00.00)	00 (00.00)
21.	Time of harvesting of lac from host plants	69 (43.13)	84 (52.50)	07 (4.37)
22.	Scraping of lac after harvesting	35 (21.88)	110 (68.75)	15 (9.37)
23.	Proper packaging of lac	30 (18.75)	120 (75.00)	10 (6.25)
24.	Storage of lac at suitable place and temperature	39 (24.38)	116 (72.50)	05 (3.12)
25.	Processing of lac	160 (100.00)	00(00.00)	00 (00.00)
26.	Processing instruments used for lac	160 (100.00)	00 (00.00)	00 (00.00)
27.	Places to sell lac	106 (66.25)	52 (32.5)	02 (1.25)
28.	Usages of lac in making by-products	160 (100.00)	00 (00.00)	00 (00.00)

Figure in parentheses shows percentage of farmers

instruments used for lac (96.25%), processing of lac (92.50%) and knowledge about crop cycle (81.25%). In case of practice wise level of adoption 11.25 per cent had adopted selection of host plants followed by selection of place (10.63%) and pruning instruments and scrapping of lac after harvesting (9.37%). Under medium level of adoption category, it was found that 91.25 per cent respondents adopted pruning of host plants, followed by proper packaging of lac (75.00%), proper storage of lac at suitable place and temperature and selection of host plants (72.50%), pruning instruments (69.38%), scrapping of lac after harvesting (68.75%), insects and their control measures (64.37%) and time of harvesting time (52.50%). Under low level of adoption category, it was found that cent per cent of the respondents (100%) had low level of adoption regarding adoption of recommended strain, adoption of host plants according to strain, processing of lac, processing instruments used for lac, theft of lac and their control measures and usages of lac in making by products regarding recommended lac production technology. This result indicates that the lac growers are aware about recommended lac production technology but at the same time they were slow to adopt recommended lac production technology. The knowledge and adoption level of lac growers can be increased through conducting training programmes on different aspects of lac production technology like processing, processing instruments, usages of lac in making by products by the concerned agencies and providing the facilities and proper guidance to the lac growers for adoption of recommended lac production technology which will be helpful in providing additional income to the lac growers.

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