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ARTICLE

Food, water and intoxicants in the battlefield practices of Rajasthan

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Abstract
This discussion brings about the niceties of some interesting practices related to food and water management that had their origin in the battlefields and military traditions of Rajasthan. From the strategic perspective, the logistics of food and drinks in the battlefields ought to be time saving, soldier friendly and followed by ease of supply. This scientific enquiry systematically unearths the rationale behind these practices and is pertinent to the logistics and strategies and relevant for the contemporary defense science too. Some of these practices could be of great help for an individual soldier as survival tricks too. The prominent food traditions and practices and high incidence of consumption of opium in the present state of Rajasthan trace their historical roots in the battlefields of the past.

Keywords Battlefield food · Battlefield practices · Defence science · Opium · Strategy · Water management

1 Introduction

There are many a documents that have addressed the art of war and niceties of battlefield practices in the ancient and the medieval world (Tzu, 1910a, 1910b; Jomini, 1862). *The art of war in ancient India* (Chakravarti, 2010) and *Military history of India* (Sarkar, 1960) are other reasonably well documented sources. Unfortunately, the logistics and food and drinks in particular, did not find any prominent space in the imagination of the strategists. Or one can say that it was not thought to be important enough to be documented. Even the classic Chinese treatise–*The art of war* of Sun Tzu (1910a, 1910b) on ancient battlefield practices has just cursory reference of the words 'food' and 'water'. Yet another classic text addressing the art of war by Antoine Henri de Jomini (1862) has elaborately described importance of logistics, reserves and supplies during war, but, the valuable text is devoid of specifics and minute details related to food and drinks. However, *The art of war in medieval India* (Sarkar, 1984, p.190, 196) has made some cursory references to logistics of the battlefield.

The logistics of 'food and drinks' is very important part of war, perhaps as important as information system or any other vital component of defense planning and execution. In armed forces it is often said, "An army marches on its stomach." The present discussion brings about some significant niceties of battlefield practices of ancient and medieval Rajasthan that could be relevant even today. From the strategic perspective, the logistics of food and drinks in the battlefields ought to be time saving, soldier friendly and followed by ease of supply.

There were a few indigenous texts in India that addressed strategy and warfare. To mention a specific reference, there was an indigenous treatise on art of war in Rajasthan, called *Sainik Śāstra*, the eighteenth century manuscript compiled during the reins of Maharaja Prithvi Singh-II of Jaipur in the period 1762–1768 CE. Preserved by Rajasthan Oriental Research Institute at Jaipur regional office (*Sainik Shastra*, Manuscript No. 12080, S.N. 204), it is scripted in Devanagri, but, written in vernacular *Dhundhāri* which is a dialect with old Rajasthani accent. Unfortunately, this is incomplete, and perhaps larger part of the text is lost in the garb of history. Moreover, there are very few people who can read and interpret it precisely. Unfortunately, neither scholars nor the strategists ever paid any attention to it. The present commentary is part of a study that is culmination of continued interaction of the author with people of Rajput community in Rajasthan for over 25 years. The information gathered all

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through these years was scrutinized and testified at various levels. In the second stage, a questionnaire prepared for this purpose was given to persons with direct or indirect familial association with erstwhile princely states or armed forces. Lastly, in the third stage, the response of this questionnaire was subjected to scrutiny of competent scientific and strategic experts in the field.

2 Food and drinks in battlefield

In the present study, we document some interesting practices and traditions related to food, eatables and water management that had their origin in the battlefield and military traditions of Rajasthan. Some of them are still prevalent. These practices are: (i) consumption of Opium, (ii) battlefield food *bātī* and; (iii) water carrier *pakhāla* and water management. *Sūraj Prakāśa*, a live commentary recorded in *Dingal* (old Rajasthani dialect) of a prominent battle fought between Maharaja Abhay Singh (rein 1724–1749) of Jodhpur and Sar-Buland Khan of Ahmedabad in the year 1730 CE, has references of consumption of opium and use of *pakhāla* (Charan, 1962).

2.1 Consumption of opium

The opium consumption trends are found to be alarmingly high in the state of Rajasthan in recent times as reported in the extensive studies by social (Lakshminarayana et al., 2009; Mathur et al., 1991, 1996; Purohit, 1988) as well as medical scientists (Ganguly et al., 1995; Malviya et al., 2011). The socio-economic aspects of these trends have been rigorously followed and investigated in all these studies. These studies prominently reveal that over all prevalence of opium addiction was found to be 8.4% in Barmer, 7.9% in Jaisalmer and 6.9% in Bikaner district of Rajasthan and that most addicts were generally males (Lakshminarayana et al., 2009; Mathur et al., 1991). The literacy and low socio-economic status have been reported as major causes for prevalence of addiction ($P > 0.05$) which is statistically significant, as the people who consume opium have poor knowledge of its ill effects in long run (Mathur et al., 1991, 1996). The reasons behind opium consumption are reportedly socio-economic backwardness, hard and harsh working conditions in the fields and intent to get rid of minor ailments and pain. In the long course of time the users become addicts. The Rajput caste group is found to be more addicted than any other caste group (Mathur et al., 1996). Statistically, these studies genuinely reflect the reality, but, there are apparent contradictions among some of their conclusions. Rajputs are land lords and they are not among the socio-economically backward people. And yet, they are amongst the most consumers of opium. There are subtle reasons behind these opium consumption trends that almost all studies conducted hitherto (Lakshminarayana et al., 2009; Mathur et al., 1991, 1996; Purohit, 1988; Ganguly et al., 1995; Malviya et al., 2011) have missed. The consumption of opium in the Rajput community has rather historical reasons.

It is documented fact that stipulated doses of opium were given to Rajput soldiers every-day (Sharma, 1990; Hooja, 2009, pp. 924–925). French traveler Bernier (1658) elaborately dwells upon the practice of use of opium by Rajputs. He wrote, "From an early age Rajputs are accustomed to the consumption of opium. On the day of battle, they never fail to double the dose, and this so animates, or rather inebriates them, that they rush into the thickest of the combat unmindful of the dangers (Smith, 1934, pp. 39–40)". Rajput troops fighting for the Mughals introduced the habit of taking opium to other soldiers too. Generally, opium was dissolved in water and was consumed. Opium consumption practices among Rajput troops continued even in the imperial forces (Jodha, 2018, p.55). Interestingly, Rajputs always fed some amount of opium to their horses as well.

Rajputs were warrior community and thus the consumption of intoxicants was part of their life style as it is common in any army or militant organization even today. More interestingly, an altogether different set of reasons emerges out of our explorations which no academic study had ever disclosed. The consumption of opium causes several after-effects, among others are: (i) opium induced constipation (OIC), (ii) loss of appetite and thirst; more importantly, (iii) opium is the ultimate pain-killer for injured soldiers; and (iv) it causes faster blood clotting in opium addicts. Chronic constipation too results into loss of appetite. These after effects were suitable for soldiers in the battlefield conditions. In addition, a little dose of opium allays fear and apprehensions in battle conditions (Lakshminarayana et al., 2009).

Soldiers were thus trained and addicted with little doses of opium (Hooja, 2009, pp. 924–925; Chundawat, 2010; Kanwar, 2016; Tod, 1832, 1997, Vol. 2, pp. 506–511). In addition to the complications related to opium induced constipation (OIC), a detail investigation of long-term effects on the health of opium addicts has many revelations. A comparative study by Malviya et al. (2011) of opium addict patients and non-addict patients has reported that opium addict patients had a significantly higher incidence of pre-operative respiratory, cardio-vascular, systemic and local complications. This study also concluded that opium addicts also suffer a much higher degree of post-operative morbidity as compared to non-addicts. Also, yet another study (Mathur et al., 1996) has reported an increased risk of tuberculosis in opium addicts. Studies have also reported in details how opium consumption adversely affected health of the opium addicts in the old age in terms of associated risk of

morbidities (Colvin et. al 2006; Chaudhary et al., 2015; Lakshminarayana et al., 2011; Pawan et al., 2011). It is said that not all, but, only a small number of soldiers, particularly, the vanguards of the army, were addicted with opium.

2.1.1 Scientific explanation of opium induced constipation (OIC)

The scientific studies and investigations on effects of opium consumption are well established. Loperamide and other opioids act on the myenteric plexus in the intestinal tract and reduce gut motility which results into constipation (Stefano, 2004; Calignano, 1991; Medical News Today, 2022). Opioids belong to the class of drugs that are chemically known as Alkaloids (Calignano, 1991; Goodheart & Leavitt, 2006; Medical News Today, 2022). There is long tradition of these drugs being used as painkillers (Colvin et al., 2006; Stefano et al., 2004; Calignano et al., 1991). Natural opioids such as codeine and morphine are derived from opiate alkaloids contained inside the resin of the opium poppy. Regular consumption of opium slows down the metabolism and that causes constipation. Chronic constipation in turn results into loss of appetite. This could be further explained scientifically as follows. Opioids often cause constipation, called "Opioid Induced Constipation (OIC)". OIC is an uncomfortable side-effect that occurs in many patients who undergo opioid treatments to have relief from pain. Like loperamide and other opioids, morphine acts on the myenteric plexus in the intestinal tract, reducing gut motility, causing constipation. The gastrointestinal effects of morphine are mediated primarily by opioid receptors in the bowel. By inhibiting gastric emptying and reducing propulsive peristalsis of the intestine, opioids decrease the rate of intestinal transit. Thus, the reduced gut secretion and increased intestinal fluid absorption contribute to the constipation. Opioids could also act on the gut indirectly through tonic gut spasm after inhibition of nitric oxide generation (Stefano et al., 2004; Calignano et al., 1991; Medical News Today, 2022). This effect was observed in animals too, where a nitric oxide precursor, L-arginine, reversed morphine-induced changes in gut motility (Goodheart & Leavitt, 2006; Calignano et al., 1991; Veterans' MATES, 2011; Medical News Today, 2022).

In short, the mechanism by which OIC is induced can be summarized as follows. Opioids cause constipation by binding to specific receptors in the gastrointestinal tract and central nervous system which results into reduced bowel motility through direct and indirect (anti-cholinergic) mechanisms. The delayed colonic transit discourages defecation, and causes excessive water and electrolyte re-absorption from feces, which further dehydrates stool (Goodheart & Leavitt, 2006; Calignano et al., 1991; Medical News Today, 2022).

However, it is not known exactly when the cultivation and consumption of opium in Rajasthan began, but, the cultivation and consumption of opium in Rajasthan was widespread throughout the medieval history and was documented as well (Hooja, 2009, pp. 924–925; Chundawat, 2010; Kanwar, 2016; Tod, 1832, 1997, Vol. 2, pp. 506–511).

2.2 *Bātī* and battlefield food

Bātī is bread-cake cooked on cinders in which wheat flour is mashed with little quantity of salt and water, and round balls made of this mixture are baked in traditional oven or cinders. These hard beads of the size of tennis ball become complete food when spices are mixed with the wheat flour. In fact, it has been preeminently a staple food in Rajasthan and the surrounding provinces. It is one of the crudest edible dishes and perhaps most primitive in origin. The preparation and cooking of *bātī* takes minimal energy and effort. It does not require any special skill to cook. Anyone can cook it with little effort. It could be cooked in large quantity by using dry cow-dung, firewood and anything available around to lit fire. A soldier sitting on the horse back could pick a *bātī* using spear just as we do it with fork and would eat it on the horse back itself.

There is an interesting painting of medieval period displayed in Mehrangarh Fort Museum of Jodhpur depicting Durgadas Rathore (1638–1718) the trusted General of Maharaja of Jodhpur, sitting on the horse back and help toasting *bātīs* with his spear during a military expedition (Fig. 1).

This picture also depicts one person sitting on the ground apparently cooking the wheat stuff whereas Durgadas seem to be helping him with his spear. In the same picture another soldier sitting on the horse back seem to be cutting branches

Fig. 1 A painting depicting Durgadas Rathore toasting *bātīs* on cinders with his spear. (Courtesy: Mehrangarh Fort Museum, Jodhpur)

of a tree with his sword for kindling. The environment in the picture is narrative of the criticality and urgency of the background circumstances, wherein, Durgadas had to flee from Aurangzeb's court in order to rescue minor prince Ajit Singh of Jodhpur. Interestingly, this piece of art was recreated based on the references of one such painting created in the rein of Emperor Aurangzeb. The references suggest that Emperor Aurangzeb (1618–1707) was in possession of two pictures based on the anecdotes that depicted two of his mortal foes, Shivaji and Durgadas (Tod, 1997, Vol. 2, p. 50). The tyrant Emperor had got them drawn by his artists. In one of those pictures Durgadas was shown in his normal position, on a horse back, toasting *bātīs* with the tip of his lance. This piece of art in display in Mehrangarh fort was painted by an artist of German origin Archibald Müller (1878–1955) (See Fig. 2).

The consumption of *bātīs* during battle expeditions finds mention in the references of Maharana Pratap's camp life too. During his exile, when Pratap moved from glen to glen, pass to pass, and from one hideout to other, the baggage of Rajput soldiers contained only *bātīs*, ammunition bag, clothes and few valuables (Sharma, 1986). According to folklore of western Rajasthan the tradition of *bātī* is even more deeply rooted in history. The folklore reveals that soldiers used to form small round balls from wheat dough and leave it buried under thin layers of sands of desert to be baked by the heat of the Sun. And, by the time they returned from any assignment after a few hours, at high temperatures of 45–50 °C these wheat balls were perfectly baked. It is well known scientific fact that sand is a quick and efficient absorber of heat. Thus, it could be viewed as primitive idea of cooking by solar energy. In good times these wheat breads were dunked into *ghee* (clarified butter) or butter-milk and relished with any meal of the day. Later the tradition of round wheat balls reached the royal court of Delhi also (Acharya, 1994, p. 138, 140; Sen, 2015, p.156). Thirteenth century traveler Ibn Batuta's travel account had a cursory reference (Acharya, 1994, p. 138, 140; Sen, 2015, p.156) to it as "In the royal banquets of Sultan of Delhi the meals used to start with thin round breads followed by roast meat cut into pieces and served with round dough cakes dunked in *ghee* (clarified butter)." There was yet another dish made of *bātīs* and was suitable for battlefield that is *churmā* and its variant *khurma*.

Churmā is coarsely grained wheat powder or crumble mixed with *ghee* (clarified butter) and sugar. Baked *bātīs* are crushed into crumble and sweetened with sugar or jaggery. Though, *churmā* itself is a popular dish, but sometimes, it is said to be the best utilization of the left over *bātīs* prepared by crushing the left over *bātīs* and adding *ghee* (clarified butter) and sugar. According to folklore, it was during a battle-march when a cook accidentally poured sugarcane juice into the *bātīs* and *churmā* was a newfound dish. Moreover, it contains high calories and remains eatable for almost one week making it suitable for military expeditions.

In the dry weather of western Rajasthan, *bātīs* remain eatable for several days. They could be stored as well. Thus, one can say that *bātīs* is a battlefield dish, discovered for battlefield especially. By all criteria, cooking skills, ease of cooking, quick toasting and cooking at large scale, it is far more suitable than *rotī* or *capātī* for battlefields even today. The round hard breads of wheat and *curmā* a dish derived from *bātīs* find the earliest mention during the time of Bappa Rawal (713–813CE)—the founder of the kingdom of Mewar (Chittore) in Rajasthan (Acharya, 1994, p. 171; Vijay, 1999). *Bātī* was the official meal of Rajputs in ancient and medieval Rajasthan during

Fig. 2 *Bātīs* being toasted on the cinders

military expeditions (Chundawat, 2010; Kanwar, 2016; Vijay, 1999).

2.2.1 Corn-cobs as food in battles and emergency

Yet another significant food related practice of battle expeditions is rooted in the history of Rana Pratap's camp life when Pratap made strategic retreat from the Mughal occupied places. These places were deserted and people descended from the Aravalis to safer places (James Tod , Vol.1, p. 275). There is a popular proverb in *Mewari* dialect which goes as:

> गऊँ छोड़ मक्की खाणो, मेवाड़ छोड़ कैठे ई नीं जाणो ।
> Consume maize (corn) instead of wheat, but never leave *Mewar* at any cost (Joshi, 1982, p. 188).

The patriotic fervor of this proverb is not easily understandable. In-depth investigation of folklore tells us about the origin of this proverb in Pratap's camp life (City Palace Museum and Library, Udaipur, 2018). Pratap insisted his subjects to grow maize instead of wheat. As part of Pratap's struggle, his subjects used to grow maize all around. Maize could be harvested in Mewar in both the crop cycles viz., *kharif* and the *rabi* and in some regions located on the lakesides and on hills people harvest maize three times in a year (Agarwal, 1971, p. 107). The soldiers moving around used to pick corn-cobs from the fields in the vicinity, roast and eat them. The entire approach was free from the hassles of storage, supply, grinding and milling of grains and cooking food. Adding salt and spice to the corn-cobs made it complete food. It was a terrific idea indeed!

2.3 Water management

The storage, supply and management of water have been very critical to the strategy and art of war. Water could be and had always been used as weapon throughout the history. Some interesting aspects of water supply and management could be observed in the history of Rajasthan too.

2.3.1 Rivers as guiding course for navigation

During medieval period there was strategic practice concerning choice of having battlefield in the vicinity of a river or a water reservoir (Bhati, 2000, p. 282). Invading as well as defending forces used to identify in advance the rivers or water reservoirs around, as part of their strategy. At least defending forces always meticulously took care of their water reservoirs. Interestingly, Antoine Henri de Jomini in his treatise *The art of war* (2007) has discussed the difficulties arising because of rivers in the battlefields and the problems of bridge-craft at length, but, has not at all mentioned rivers as guiding course in the military expeditions. Rivers served as guiding course for the march of the Turks and the Mughals into the interiors of any territory during their military expeditions. In 1428, the forces of Mubarak Shah marched to Bayana (now in Rajasthan) along the course of river the Chambal (Sharma, 1990, p.7, 140, 228). River Banas had been a guiding course for Mughal Commander Man Singh to reach the interior of Mewar. Man Singh in the battle of Haldighati adopted river Banas as his military frontier (Sharma, 1990, p.7, 140, 228). Apart from navigation, rivers were the most vital source of water for drinking and preparation of food for large armies comprising of thousands of soldiers during long expeditions. There was yet another critical issue that an army with strength, say of the order of twenty thousand soldiers used to face during camps and expeditions: "How twenty thousand soldiers used to get relieved in every morning?" It could be possible only in the vicinity of rivers wherein water is not stagnant. It is neither possible near ponds nor in the vicinity of wells.

2.3.2 Scorched earth tactics in Rajasthan

It is imperative to note that there had been a practice of poisoning the wells, tanks and other water reservoirs in medieval and ancient times, known as scorched earth tactics. This was aimed at halting and harming the advancing enemy forces. There are well recorded instances of this tactics in the history of Rajasthan too. However, this cannot be applied effectively to rivers. Thus, rivers could be best used as a geographical guiding course and support system for all military expeditions. Rao Pahoo Bhati, the ruler of Pugal, an erstwhile principality in Rajasthan had adopted a very special water strategy. In eleventh century Rao Pahoo dug up many wells around Pugal (Tod, 1832, 1997, p. 192; Bhati, 1989, p. 42, 185, 434). These wells are still identified as *Pahoo Vera* (wells created by King Pahoo). But, the wise ruler did not let exist any water source in the territory up to 60 km from the centre of kingdom. As a result, the invaders could not find even a drop of water in certain region.

2.3.3 *Pakhāl* tradition in western Rajasthan

In western Rajasthan, where there were not many rivers, the water supply during battlefields was even more crucial. The military expeditions were accompanied with *pakhāls* (Charan, 1962). It is a kind of big water container made of camel skin which could store about 200 L of water and was laden on the camel or an ox back. It was almost 20 times bigger than a *maśak*. These days, *pakhāl* is almost extinct. One would rarely find it in the interior of Thar Desert. In the recent past the Khādi Grāmodyoga department of state had produced *pakhāls* made of canvas. Indian defense forces, particularly the Border Security Force use camels for patrolling on the border, but, they too do not use *pakhāl*, which

they could effectively do. We can modify or improvise the shape and structure of *pakhāl* and encourage their use even today.

3 Conclusion

A systematic enquiry into the opium consumption trends in the state of Rajasthan reveals that the root cause of this problem is the battlefield practices of the past. Interestingly, the prominent food items and practices of Rajasthan too have their roots in the past battlefields. The logistics and supply of food and water is as important in the present world as it was in the past. Thus, it is imperative to learn a few lessons from the traditions and practices of the past. Due emphasis could be given to the specifics mentioned in the present article in the research and development of strategic aspects related to food and drinks. As part of strategy, water resources ought to be identified in advance around the ground zero. The camel squads of Border Security Force used for patrolling could be equipped with *pakhāls*. The *pakhal* tradition could be revived with due improvisations.

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Data availability statement The pakhal made of canvas are easily available on the outlets of state department- "Rajasthan Khadi Gramodyog Department.

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