

Brewing *O*: The Traditional Art of Making Rice Beer among the Apatani of Arunachal Pradesh

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ABSTRACT: Rice beer, locally known as ‘*O*’, occupies a central place in Apatani domestic and ritual life in Arunachal Pradesh. This paper presents a process-oriented ethnography of Apatani brewing, tracing the cycle from the preparation of *epoh* (starter culture) through fermentation, storage, extraction, and classification. Based on ethnographic observation and interviews, it examines how fermentation is managed through stage-specific containers, environmental control, and sensory monitoring. Changes in warmth, liquid flow, and timing of transfer between containers guide intervention, while distinctions in maturity and extraction inform evaluation of quality. The study shows that Apatani brewing operates as an embodied system of indigenous fermentation knowledge sustained through domestic practice and socially regulated conduct, contributing to anthropological discussions of indigenous food technologies in Northeast India.

INTRODUCTION

Rice beer plays a central role in the domestic, ritual, and social life of many indigenous communities across Northeast India (Nath et al., 2019). Among the Apatanis of Arunachal Pradesh, rice beer, locally known as *O*, features in major life-cycle events, agricultural rituals, and communal gatherings. It is offered to guests, shared during collective labour, and used in rituals involving both living participants and spirits, forming part of wider systems of social and ritual exchange (Mandelbaum, 1965). Across the region, rice beer traditions such as *Apong* among the Mising and Adi, *Judima* among the Dimasa, and *Zutho* among the Angami have been documented primarily in relation to agriculture, ritual practice, and social exchange (Roy et al., 2004; Nath et al., 2019). Rice beer has also been examined as a site

of social and religious negotiation in contemporary contexts (Janowski, 2011; Longkumer, 2016).

In the Apatani context, *O* is integral to agricultural activities, festivals, and domestic life (Kaning, 2008). More broadly, existing scholarship on rice beer in Northeast India has examined fermentation in terms of starter cultures, ingredient composition, and microbial processes shaping taste, strength, and stability (Deori et al., 2007; Tanti et al., 2010; Das et al., 2012). Brewing knowledge has also been described as transmitted through domestic practice and is often associated with gendered expertise (Ghosh and Das, 2004; Kaling and John, 2017). However, these studies do not examine how fermentation is actively managed in practice. In particular, how brewers organise stages, use material arrangements, and evaluate fermentation through sensory criteria remains underexplored.

This study draws on ethnographic observation and interviews to examine Apatani rice beer brewing, New Series © SERIALS

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from the preparation of *epoh* (starter culture) through fermentation, storage, extraction, and classification. It focuses on how fermentation is managed through container use, environmental adjustment, and sensory monitoring. Attention to warmth, liquid flow, and the timing of transfer between containers guides intervention, while distinctions in maturity and extraction shape the evaluation of quality. Brewing is shown to operate as an embodied and regulated form of indigenous technical knowledge, sustained through household practice and social norms. By foregrounding these processes, the study contributes to anthropological discussions of indigenous food technologies in Northeast India.

MATERIAL & METHODS

The study was conducted in Ziro Valley of Lower Subansiri district, Arunachal Pradesh, where the Apatani community is concentrated. The valley comprises of seven Apatani villages, namely Bamin Michi, Bulla, Dutta, Hari, Hija, Mudang Tage, and Hong, with a combined population of 42,352 according to the Census of India 2011. The Apatanis of Ziro Valley are a settled agrarian community whose social life is closely linked to wet rice cultivation and ritual practice. Their origin and migration narratives are preserved in oral traditions, through which they trace descent from the ancestral figure Abotani. Settlement patterns consist of compact villages surrounded by paddy fields. The economy is centred on permanent wet rice cultivation with integrated paddy fish farming, supplemented by weaving and the rearing of domesticated animals for ritual purposes. Religious observances, seasonal festivals, and customary institutions shape everyday social relations.

The research was based on ethnographic fieldwork carried out among Apatani households in these villages. The study adopted a qualitative ethnographic approach, employing observation and interviews as the primary methods of data collection. Brewing practices were documented in detail, including preparation techniques, tools, sensory monitoring, and the processes involved in managing fermentation. Repeated engagement within household settings enabled close observation of brewing across different contexts.

Interviews were conducted primarily with women engaged in brewing activities. Participants were purposively selected to include individuals with direct experience in brewing, as well as elderly persons recognised for their knowledge of customary practices associated with *O*. Interviews were supplemented by follow-up discussions to clarify processes and variations observed during fieldwork.

RESULTS

Preparation of Epoh (Starter Culture)

The preparation of 'O' begins not with fermentation itself but with the making of *epoh*, the starter culture used in fermenting rice and millet into beer. *Epoh* is prepared annually in most households and forms the basis of fermentation.

Women typically collect one of two rice varieties, known as *pyaat miepya* and *emo*, before the grain has fully ripened. Partially ripened grain is preferred because, at this stage, the husk adheres firmly to the grain. When pounded, both grain and husk form a fine powder. Fully ripened rice, by contrast, separates easily from its husk and breaks into fragments rather than powder, making it unsuitable for *epoh* production. The inclusion of powdered husk is essential. After grain selection, pounding (*du hula*) was traditionally carried out collectively in a wooden mortar (*yaper*) using a pestle (*hunyi*), often placed in the *byachi*—the transitional space between the interior and front porch of the house. Two individuals pounded in rotation while others stood ready to replace them, ensuring an uninterrupted rhythm. At the same time, a separate person performed *juju*, winnowing the mixture in a tray (*yapio*) to separate fine powder from coarse fragments, which were repeatedly returned to the mortar until a fine texture was achieved.

Once the rice–husk powder was prepared, water was added gradually and the mixture kneaded into small cakes, referred to as *epoh pohtan* (newly prepared *epoh*). These were arranged in a basket (*yopo*) and mixed with powdered old *epoh* (*epoh poli*). The cakes were then placed in the granary (*nesu*), where space was adequate, although smaller batches were sometimes kept inside the house. Laid

over a bed of rice husks (*piinan*), they were turned twice daily for three days. During this period, a strong, pleasant smell develops as fermentation progresses.

During this stage, the work was historically overseen by elderly women who observed specific taboos over the three-day turning period. They avoided houses where death had occurred, refrained from cooking, and observed specific bodily and behavioural restrictions associated with ritual propriety. Although households now perform the mixing themselves, the memory of specialist involvement persists, and *epoh* prepared under such observances is regarded as more suitable for use as *epoh poli*.

In recent years, changes in processing techniques have altered the pace of preparation but not its fundamental sequence. Machine grinding has replaced communal pounding in many households; however, the overall cycle of grain selection, pulverisation, mixing with *epoh poli*, and drying remains consistent.

Material and Spatial Organisation of Brewing

Brewing *O* involves a coordinated arrangement of containers, implements, and architectural spaces that together shape fermentation across its different stages.

Fermentation proceeds through a sequence of stage-specific containers. Primary fermentation begins in the *yagg*, a woven bamboo basket used after *epoh* is mixed into cooled grain. During this stage, leaves (*yanii*) line the interior. The woven structure allows airflow and permits liquid to drip during the *kalii* stage (transfer stage) prior to transfer. Following this, the fermenting mash is stored in *yakhan*, a bamboo-and-cane container used for fermentation and longer-term storage. Two sizes are recognised: the larger *khara yakhan* and the smaller *khanchi yakhan*. The exterior is sealed with *sankhan*, a resin used for sealing, traditionally obtained from the neighbouring Nyishi community.

In addition to fermentation containers, a range of implements supports cooling, storage, extraction, and serving. The *piipin*, a flat bamboo mat, is used to cool cooked grain before *epoh* is added, ensuring

suitable conditions for fermentation. Fermented *O* and mash may be stored in *pinta*, a gourd container, particularly when *halyan* (the central portion of the mash) is reserved separately. *Halyan* kept in a *pinta* remains soft (*meh-meh*) and is less prone to turning *akha* (over-fermented or sour), indicating that storage conditions continue to shape fermentation after initial processing. The *yaju*, a gourd mug, is used for serving *O* and is associated with marriage rituals such as *mahbo inchi* and *mida*, where a designated *mahbo yaju* (for the son-in-law) may be filled with *O ala* (undiluted extract) for ritual tasting. Bamboo filtering devices—including *O sader*, *O bader*, and *O byun*—are used to separate liquid from fermented mash at different stages of extraction.

Architectural arrangements further regulate fermentation conditions. Fermenting baskets were traditionally placed above the *reke* (the bamboo ceiling structure in traditional Apatani houses), where heat rose from the hearth below. Houses and granaries (*nesu*) featured split bamboo floors that allowed air circulation and facilitated the drying of *epoh*. In contemporary settings, the adoption of tin (*tina*) roofing has altered interior conditions, creating warmer environments that affect fermentation.

Material and spatial organisation has also changed over time. Metal containers and plastic buckets have increasingly replaced *yakhan*, while plastic rice sacks sometimes substitute for *yagg*. Machine milling has replaced communal pounding, and plastic sheets are occasionally used in place of *piipin*. Despite these shifts, the sequence of container use and the coordination between materials and stages remain consistent.

Fermentation Process and Management

After the prepared grain is mixed with *epoh* and placed in a fermentation basket (*yagg*) lined with leaves, fermentation begins. Within a day in summer, though often taking longer during colder months, warmth begins to develop inside the fermenting mash. The heat is first felt in the lower portion of the basket and gradually rises through the mixture. As fermentation progresses, liquid seeps from the basket. The appearance of this moisture marks the stage at which the mash is transferred to a storage

container, such as a *yakhan* or, in contemporary practice, a metal container. This transfer process is known as *kalii*.

In earlier practice, particularly during winter, the fermenting basket was kept above the *reke*, where heat and smoke rose from the hearth. Liquid dripping onto the floor served as an indication that fermentation had advanced. A small intentional gap was sometimes left in the leaf covering to allow this liquid to escape. Fermenting baskets are now usually kept on the floor rather than above the *reke*, rendering this sign less immediately visible. As a result, the visible sign of dripping is no longer immediately apparent. Under these conditions, tactile monitoring becomes more important. The warmth of the basket is felt with the palm, and the progression of fermentation is judged by the extent to which heat has risen within the mash. The basket is checked several times a day, and when it feels sufficiently warm, it is lifted slightly to check for moisture at the base.

The transfer from basket to storage container occurs at a specific stage in the fermentation process. If the mash is moved prematurely, fermentation remains underdeveloped; if transfer is delayed after liquid begins to drip, some liquor is lost. Once transferred to the storage container, the fermenting mash gradually cools and stabilises before it is considered ready for extraction.

While the basket-to-container transfer remains the preferred method, an alternative approach, in which the fermenting mixture is placed directly into a metal container without undergoing this shift, is known as *iibo nii*. This method is regarded as producing inferior taste, particularly in winter when fermentation proceeds more slowly.

Fermentation duration varies even when the same *epoh* and quantities of grain are used, with some batches maturing faster than others. Seasonal conditions, particularly temperature, influence this variation. Outcomes are also attributed to the “hands” of the brewer (*ala pa lyido*), with certain individuals regarded as consistently producing better or stronger *O*. Other factors affecting the outcome include insufficient cooling of the cooked grain before mixing in *epoh*, excessive exposure to air after the mash is placed in the basket, the use of old or weakened

epoh, and high summer temperatures that may lead to over-fermentation (*akha*). Conversely, using too little starter may result in prolonged sweetness (*ajan*), indicating incomplete fermentation. Based on such sensory experience, subsequent batches are adjusted. If the beer produces a burning sensation on the tongue (*akha aya*), less *epoh* is used in the next batch; if it lacks strength, the proportion of starter is increased.

Sensory Evaluation and Stages of Maturity

O varies over time, with its character changing as fermentation progresses. These changes are recognised and named through distinct stages of maturity. A progression runs from *ajan* (young) to a balanced stage and finally to *akha* (over-aged).

When *O* has fermented for only three to four days, it is referred to as *O ajan* (“young *O*”). At this stage, the taste remains sweet (*tihi*) and mild. While some younger or occasional drinkers prefer this form, others consider it insufficient. As expressed in the phrase *O ajan do, si tam talo ma*, young *O* is understood as lacking sufficient character. With further fermentation, the beer reaches a stage described as *titi buru*, indicating a condition that is neither too young nor over-aged. At this stage, the taste is described as *tampyo do* or *tilyo tibo do*, denoting a pleasant or well-developed flavour. Particularly successful batches may be praised as *tiser bwlyi ano tampyo do*. If fermentation continues beyond this point, *O* becomes over-fermented. Deteriorated or sour batches are described as *ponkhu do poya do*, indicating that the beer has passed its desirable condition.

In evaluating these stages, distinctions are made between sweetness, strength, and harshness. Sweetness is associated with early fermentation and does not indicate maturity; excessive sweetness corresponds to the stage of *ajan*. Conversely, a sharp or burning sensation (*akha aya*) is associated with over-fermentation. A well-made batch is valued for balance, being neither overly sweet nor harsh but smooth and sufficiently strong.

Texture and colour also form part of this evaluation. Matured *O* may develop a reddish shade (*dolan*), whereas beer derived from a less mature

fermented mash appears thinner, resembling the starchy water released during rice cooking. *O* stored in a *pinta* remains soft without quickly turning *akha*.

Internal Differentiation Within the Fermented Batch

Differentiation occurs both across stages of maturity and within a single batch of fermented mash. During transfer from basket to storage container, variation is observed within the mash itself. The central portion, known as *halyan*, is considered superior, while the side portions are usually consumed first. This central portion may be reserved and sometimes placed separately in a *pinta* for storage. At the time of transfer, it is warmer and sweeter and particularly favoured when freshly removed. In certain ritual contexts, such as house construction, it may be set aside for later serving.

A further distinction emerges at the stage of extraction, based on whether liquid is obtained before or after the addition of water. *O ala* refers to the liquid that emerges naturally from the fermented mash before any water is added. This undiluted extract is regarded as especially strong and is served in this form during major ceremonies, particularly the Myoko festival. Once water is added to the mash, the character of the drink changes. The resulting liquor is lighter and less concentrated than *O ala* and constitutes the standard and most commonly consumed form of *O*.

Varieties of 'O' and Secondary Processing

Different forms of *O* are distinguished through variations in ingredient composition and secondary processing. The most common preparation, known as *Sarse O* or *Pore O*, combines rice, millet (*sarse*), and *epoh*. Grain proportions vary between households, with some using equal quantities of rice and millet and others favouring a higher proportion of rice. A rice-heavy mixture produces greater quantities of *O ala*, whereas higher millet content is associated with stronger flavour. These differences in proportion also affect extraction after water is added, influencing thickness and ease of squeezing. Extraction is further shaped by maturity: younger mash is more difficult to squeeze, whereas mature mash releases liquid

more readily. After the first extraction, the fermented mash may be reused. When water is added again to this residual mash, the resulting brew is called *Pokhe O*, which is lighter and less potent than the first extraction.

Another form, *Nyanyin O* (or *Hupi O*), is prepared entirely from rice without millet. The fermented rice mash, known as *nyanyin pohna*, may be consumed directly, sometimes mixed with warm water, combined with rice and sugar, or eaten in solid form, particularly by older people. In some villages, it is associated with house construction and distributed upon completion of the framework.

A further variation, *Siira O*, refers to a distilled liquor produced from previously brewed *pohna*. Distillation techniques were introduced several decades ago. While once rare, this practice has become more common, particularly when residual mash is available.

Social Regulation of Brewing Practices

Starter preparation is subject to specific forms of social regulation. The mixing of powdered old *epoh* (*epoh poli*) into a fresh batch (*epoh pohtan*) is referred to as *poli linwn*. Not all individuals are regarded as suited to perform this task; for some, the starter is said not to “turn out tasty.” Households sometimes sought women known for reliable “hands” for this work.

In addition to recognised skill in starter preparation, the period during which the starter matured was accompanied by specific behavioural observances. This responsibility was often undertaken by elderly women, who were no longer actively involved in social gatherings, and whose work was typically compensated in rice grain. During the three-day turning and drying period in the granary, these observances included avoiding houses where death had occurred or major rituals were underway, refraining from cooking, not rearranging the hair, and avoiding contact with animal excreta until the cycle was completed. Although most households now prepare *epoh* without specialist intervention, starter prepared under such observances is regarded as more suitable for future use as *epoh poli*.

Regulation also extends into the fermentation phase. During active fermentation, certain sour

fruits, such as *pecha* and *bachhin*, are avoided within the household. Contact with these foods is believed to affect the fermenting mash, potentially causing it to sour prematurely. For this reason, careful washing of hands after handling such items is emphasised.

DISCUSSION

Processual and Material Organisation of Fermentation

The preparation of *epoh* marks the beginning of a fermentation process in which each stage establishes the conditions for the next. Brewing unfolds through a sequence of stages involving the movement of fermenting mash across different containers, through which fermentation proceeds as an ordered progression. This organisation extends across batches, seen in the reuse of *pohna* and the distinction between successive extractions, linking one cycle of fermentation to the next. This sequence is evident in processes such as *kalii*, where the fermenting mash is transferred between containers at a critical stage.

Within this sequence, particular moments require precise timing and handling. The transfer process known as *kalii* marks a critical point at which the fermenting mash must be moved at the appropriate stage of development. Variations in outcome indicate awareness of distinct stages in fermentation, distinguishing between underdeveloped, optimal, and over-fermented conditions. Fermentation is guided by sensitivity to changes in the fermenting mash.

Fermentation depends on the material and environmental conditions in which it takes place. Variation in grain composition influences yield, flavour, and extraction, while the use of containers and implements regulates airflow, moisture, and containment across stages. Temperature also plays a significant role, with seasonal differences affecting the rate and progression of fermentation. Despite changes in materials, techniques, and spatial arrangements, the organisation of fermentation remains consistent. New elements are incorporated alongside established sequences and evaluative criteria, allowing the process to remain stable and adaptable.

Embodied Knowledge and Skilled Practice

Fermentation is monitored through sensory cues, with changes in the fermenting mash guiding decisions about when to intervene. Rather than relying on fixed measures, brewers attend to shifts in condition as they occur, using these cues to determine when actions such as transfer or adjustment are required. For instance, sensing the rise of warmth within the mash and the timing of transfer guides decisions about when to intervene. This monitoring reflects embodied knowledge grounded in practice. Competence develops through continued engagement with fermentation, enabling brewers to recognise appropriate conditions and respond through experience. Assessment draws on familiarity with the process.

This knowledge is expressed through a structured system of classification used to evaluate fermentation. Named stages provide a framework for understanding progression, while evaluation operates across multiple dimensions, including taste, texture, colour, and variation within the batch. These assessments extend over time, linking sensory judgement to the recognition of stages and the timing of intervention.

Brewing outcomes also vary across batches, even when similar materials are used. This variation highlights the importance of individual skill, with some brewers consistently recognised for producing better or stronger *O*. Brewing therefore involves ongoing adjustment in response to prior outcomes and changing conditions, as brewers modify proportions and techniques to achieve balance.

Social Organisation and Transmission of Brewing Knowledge

Fermentation operates within a framework of social regulation that shapes how brewing is conducted at different stages. Norms of appropriate conduct guide practice, linking successful fermentation to technical processes and adherence to socially recognised conditions. Different forms of *O* are associated with particular contexts of use, connecting stages and products to specific domains of social life.

This regulation is evident in the allocation of tasks and the recognition of competence. Key stages of brewing are often carried out by individuals regarded

as reliable, with experience and trust shaping such roles. This is reflected in the recognition of certain individuals as having reliable 'hands' (*ala pa lyido*) for starter preparation. These roles are frequently associated with elderly women, whose experience is valued. Behavioural discipline is maintained across stages, with specific forms of conduct observed to ensure appropriate conditions for fermentation.

Brewing also operates as a system of indigenous technical knowledge transmitted through participation in socially organised roles within the household and community. Competence develops through continued involvement in the brewing process, and knowledge circulates across households and within the community. Despite changes in materials and practices, the organisation of brewing remains consistent, with established sequences and evaluative frameworks continuing alongside adaptation to new conditions. Brewing is sustained through continuity in social organisation even as its forms and practices change.

CONCLUSION

This paper has examined Apatani rice beer (*O*) brewing as a coherent system of indigenous fermentation knowledge rather than a set of isolated practices. From the preparation of *epoh* to fermentation, extraction, and classification, brewing operates as a stage-specific process in which each phase establishes the conditions for the next.

This system is sustained through embodied and experiential knowledge. Fermentation is monitored through perceptual cues and adjusted in response to variations in outcomes, while material arrangements, environmental conditions, and socially recognised competence shape practice.

Taken together, these elements show that Apatani brewing functions as an integrated technical system in which process, evaluation, material regulation, and social organisation are closely

interrelated. Fermentation is actively managed through ongoing adjustments grounded in sensory judgement and experience. Despite changes in materials and techniques, the persistence of these practices indicates continuity in the underlying logic of fermentation.

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