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## Village Period Cultivation of Faba Bean (Vicia faba L.) at Chega Sofla, Southwestern Iran: New evidence from the Southeastern Fertile Crescent

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**Abstract**

The origin and early dispersal of faba bean (Vicia faba L.) remain difficult to reconstruct due to the absence of extant wild progenitors and the limited preservation of archaeobotanical remains. This study presents new evidence for faba bean cultivation from the Late Village Period site of Chega Sofla, in southwestern Iran. Seven charred faba bean seeds, recovered from a storage context associated with an in situ burning event, were identified and analyzed morphologically. One seed was dated using AMS radiocarbon analysis, yielding a calibrated age of 6486–6387 cal BP. Morphometric observations indicate that the Chega Sofla faba beans belong to a small-seeded type and are generally smaller than many published assemblages from contemporaneous or later sites in Southwest Asia and Europe. Given the limited sample size and the effects of charring on seed morphology, these observations should be regarded as descriptive rather than explanatory. Nevertheless, the securely dated remains provide direct archaeobotanical evidence for faba bean cultivation in southwestern Iran during the Chalcolithic and contribute to refining the spatial framework of early legume agriculture beyond the Mediterranean core of the Fertile Crescent. The findings highlight the role of crop diversification and storage practices in the agricultural systems of southern Iran in the Village Period.

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## 1. Introduction

Faba bean (Vicia faba L.), one of the oldest food legumes cultivated by humans, is not only for human consumption, but also a good source of supplemental protein for livestock and poultry (Crépon *et al.,* 2010; Duc *et al.,* 2010; Smýkal *et al.,* 2015; Punia *et al.,* 2019; Meng *et al.,* 2021). According to the Food and Agriculture Organization of the United Nations (FAO), as of 2023, faba beans are cultivated in 66 countries and regions worldwide, covering a harvested area of 2.78×106 ha with a total production of 6.07×106 t (FAO, 2024). Modern agricultural systems play a crucial role in sustainable agriculture by cultivating faba beans to improve soil fertility, reduce greenhouse gas emissions, optimize cropping systems, and enhance soil structure and water use efficiency (Jensen *et al.,* 2010; Köpke & Nemecek, 2010; Zong *et al.,* 2019).

Available archaeological and genomic evidence suggests that faba beans were originally domesticated in Southwest Asia (Zohary & Hopf, 1973; Kislev, 1985; Tanno & Willcox, 2006; Caracuta *et al.,* 2016). According to archaeobotanical evidence and studies of extant plant populations, the origin and wild ancestry of the faba bean likely lie in the eastern Mediterranean Basin, from where it spread with the expansion of agricultural communities into Europe, India, and Ethiopia (Zohary & Hopf, 1973; Cubero, 1974; Wang *et al.,* 2012). At the Bronze Age site of Tel Kabri in Levant the cultivation of small-seeded faba beans was intensively managed, and their combination with other legumes highlights the diversity and ecological adaptability of the household economy during that period (Nicoli *et al.,* 2023). Research at the Gabii site in Iron Age Italy indicates that faba beans already played a significant role in the agricultural systems and land management strategies of the period (Gavériaux *et al.,* 2024). Taking the agricultural development of southern Italy around the medieval period as an example, the diffusion and evolution of faba bean types show a clear chronological pattern: only the small-seeded type was cultivated before the early Middle Ages; the medium-seeded type first appeared in archaeological contexts dating to the 8th century; and reliable evidence for the large-seeded type does not emerge until after the 12th century (Fiorentino *et al.,* 2026). According to the archaeobotanical records and phylogenetic studies, the wild ancestor of the faba bean was likely fully transformed into a cultivated species during domestication, result in the absence of wild populations today; Moreover, its domestication process appears to have differed from that of the major crops traditionally cultivated in the Fertile Crescent, such as barley and wheat (Leht, 2009). Today, faba beans are generally classified into three varieties based on seed size: large (Vicia faba var. major), medium (Vicia faba var. equina), and small (Vicia faba var. minor) (Cubero, 1974; Nadal *et al.,* 2003). Large-seeded faba bean types are used for human consumption, while small-seeded types serve mainly as livestock feed, fertilizer, and rotational nitrogen-fixing crops (Crépon *et al.,* 2010; Temesgen *et al.,* 2015). Archaeological evidence shows that from the Early Neolithic through the Roman period, faba bean varieties predominantly belong to the var. minor type (Zohary *et al.,* 2012). Larger-seeded types (such as V. faba var. major) appeared much later, and there are notable East-West geographic differences in seed morphology from the same period (Zohary & Hopf, 1973). However, the wild population

of cultivated faba bean remains unclear and may have been geographically limited or extinct (Terzopoulos & Bebeli, 2008; Rottenberg, 2020).

In summary, archaeological evidence of faba bean cultivation in ancient agriculture illuminates the spatial-temporal context and evolutionary trajectory of its origin, spread, diffusion, cultivation, and domestication. Additionally, studies of variety selection, agricultural adaptations, and changes in farming practices provide deeper insights into the social organization, economic structure, and cultural development of that period. Therefore, the present study, based on the chronological and morphological analysis of charred faba bean macrofossils from Chega Sofla, aims to supplement the archaeobotanical record of faba bean cultivation on the southeastern margin of the Fertile Crescent by providing temporal reference points for its dissemination. Building on this, the study attempts to explore the pathways of faba bean spread from the Mediterranean coast inland and the evolution of its diversity.

## 2. Analysis and decision

Chega Sofla (Fig. 1) is located in the southeastern part of the Fertile Crescent, within the transitional zone between the Zagros Mountains and the northern coast of the Persian Gulf. It lies on the Zohreh Plain, south of Behbahan city in Khuzestan Province, Iran, adjacent to the Zohreh River. The Zohreh River flows from the Zagros Mountains to the Persian Gulf, providing a stable water source for prehistoric agriculture and settlement. Although the site and the Behbahan Plain are separated by local ridges, they are connected via the Khairtabad River valley, which has historically facilitated transportation and cultural exchanges in the Zagros-Persian Gulf region (Dittmann, 1984). According to the Köppen-Geiger Climate Classification (Peel *et al.,* 2007), most of Khuzestan Province features tropical desert and tropical/subtropical steppe climates with highly seasonal precipitation primarily occurring in winter and spring, peaking in the mountainous areas; summer is hot and dry with scarce rainfall throughout the province. The site is located on a plain at an approximately elevation of 150 m, where annual precipitation is about 130-250 mm, which is lower compared to the mountains regions (Peel *et al.,* 2007; Raziei *et al.,* 2014).

In the 1970s, Hans Nissen from the Oriental Institute of the University of Chicago conducted archaeological reconnaissance in the Zohreh Valley and later on, Reinhard Dittmann carried out regional investigations of the fifth-millennium BCE sites in Behbahan region and the Zohreh Plain, reporting the site as “Chogha Sofla” and identifying it as one of the most important prehistoric settlements in the Zohreh Plain (Nissen & Redman, 1971; Dittmann, 1984; Moghaddam, 2016). Since 2015, Abbas Moghaddam has led the Zohreh Prehistoric Project (ZPP), which employs a multidisciplinary approach to systematically study the site (Moghaddam, 2016). In 2021, Chega Sofla was included on UNESCO’s Tentative List of World Heritage Sites under the title of “The Ritual Landscape”.

Chega Sofla covers approximately 180 hectares, including about 20 hectares of settlement area and roughly 160 hectares of cemetery (approximately 2000×800 m). Although undisturbed basal layers have not yet been reached and the earliest occupation remains uncertain, archaeological

evidence indicates that the site was occupied approximately between 5000 and 3700 BCE, making it one of the largest prehistoric sites in the northern Persian Gulf region (Moghaddam, 2016; Moghaddam & Miri, 2021).

### 3. Archeological sample collection

The charred plant remains analyzed in this study were recovered from Area A on the eastern mound of the site (Fig. 1c). Sampling was conducted in February 2017, specifically from Cluster No. 4 (Fig. 1d), which is located in the northeastern corner of Space 2 in Area A (Fig. 1d), at a depth of 74 cm above the site datum (Moghaddam, 2018).

Sampling strategy was context-driven rather than probabilistic and focused on a single, well-defined depositional unit in order to minimize Taphonomic mixing. The sediment samples (totaling 78 liters) were collected exclusively from Cluster No. 4, a dense concentration of charred

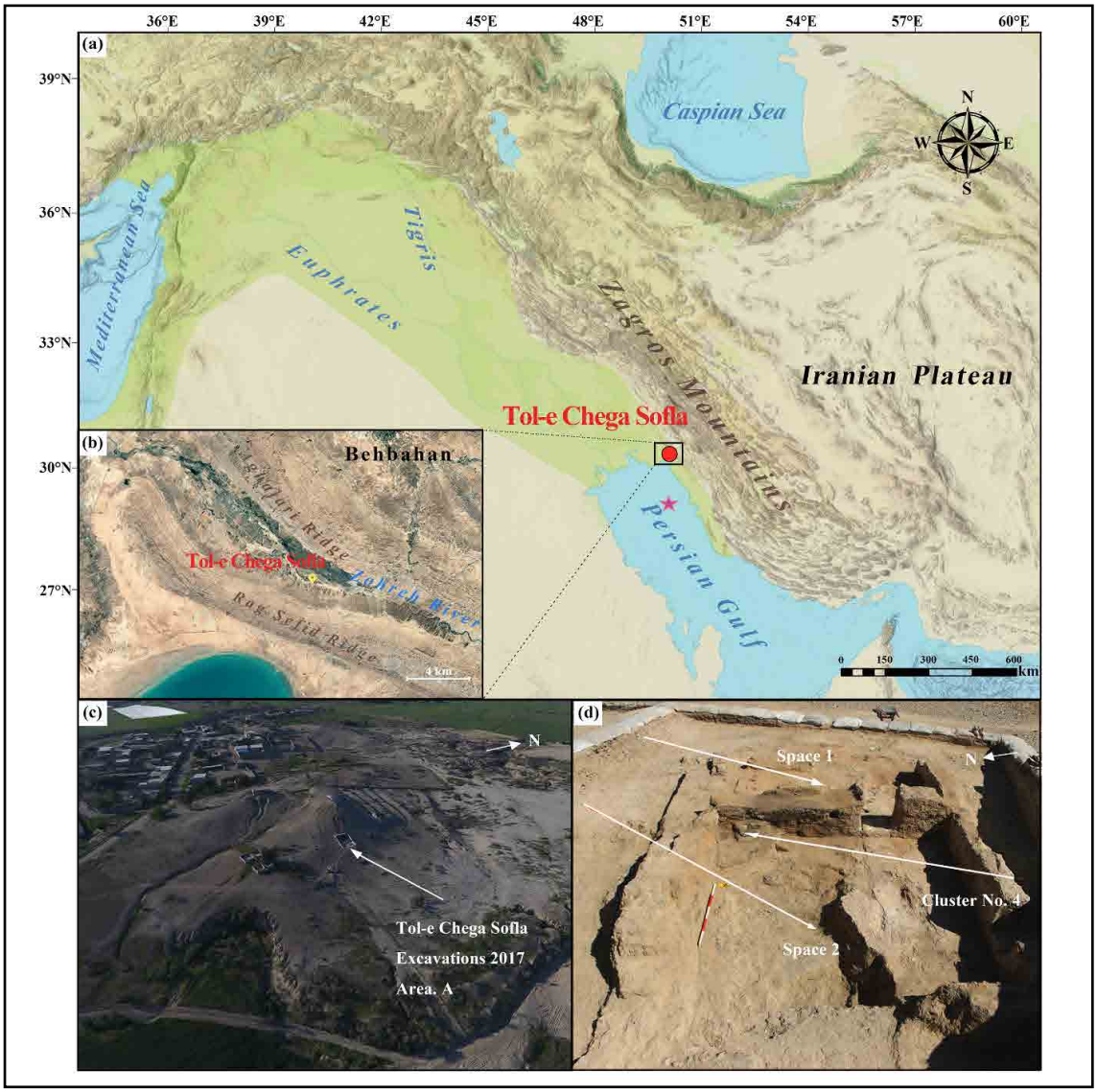



**Fig. 1: Comprehensive information map of Chega Sofla. a. Location map of the study area, and the area shaded in green on the map indicates the region known as the Fertile Crescent; b. Location map of the site; c. Aerial photo of the excavation area in Area. A (2017); d. Find spot of the plant macrofossils.**

plant remains directly overlying an occupation surface and associated with clear in situ burning indicators, including fired mudbrick fragments, ash lenses, and a heavily fire-blackened ceramic jar. No redeposited or secondary contexts were included. This targeted approach was adopted to ensure a high degree of contextual integrity and to allow the recovered plant remains to be interpreted as a single depositional episode related to storage and destruction by fire, rather than as an accumulation formed over an extended period.

To reduce identification bias, all legume remains were examined independently by multiple analysts and were only attributed to Vicia faba when diagnostic morphological traits were consistently observed, including overall seed shape, radicle morphology, and cotyledon configuration. Measurements were taken only from sufficiently preserved specimens to avoid distortion caused by intense charring or fragmentation. Given the known effects of carbonization on seed shrinkage and deformation, metric data were treated as comparative indicators rather than absolute size proxies. As a result, morphometric comparisons emphasize relative patterns across sites and periods rather than precise taxonomic thresholds.

Although the assemblage size is limited, the strict contextual control and the secure association with a single storage-related burning event allow the Chega Sofla faba bean remains to be interpreted with a high degree of chronological and behavioral confidence.

Identification and analysis of archaeobotanical remains

Firstly, the stored plant remains recovered from the site were subjected to detailed taxonomic identification. Identification was carried out using a Leica M205 C stereomicroscope through comparison with modern reference seed collections, published plates of archaeological plant remains, and relevant seed atlases (Bojňanský & Fargašová, 2007). After identification, the seeds were photographed, counted, and morphologically measured using LAS V4.12 software.

## 4. Chronology

A fragment of a faba bean seed was sent to the US Beta Laboratory for AMS14C dating. The result was subsequently calibrated using OxCal 4.4 online program (https://c14.arch.ox.ac.uk/oxcal/OxCal.html) and the IntCal20 database (Ramsey, 2009; Reimer *et al.,* 2020).

Only one faba bean specimen was selected for AMS radiocarbon dating due to the very limited number of well-preserved remains and the need to minimize destructive analysis. Among the recovered specimens, the dated seed fragment was chosen because it exhibited sufficient carbonized material for reliable measurement and derived from a secure, well-defined context associated with an in situ storage-related burning event. Given the strong contextual integrity of Cluster No. 4 and the absence of evidence for post-depositional disturbance, this single AMS determination is considered representative of the depositional episode that produced the faba bean assemblage. While additional dates would further refine the chronology, the present determination provides a robust temporal anchor for the assemblage within the Late Village Period.

## 5. Morphological analysis

Due to the relatively limited number of faba bean seed remains at archaeological sites and the

scarcity of morphological measurement data, this study compares the morphological measurements of faba bean remains from typical sites in Southwest Asia spanning the Pre-Pottery Neolithic to the Pottery Neolithic, and in Europe from the Bronze Age to the Iron Age. The main selected indicators include length, breadth, thickness, and the thickness-to-length ratio (T/L) of the faba bean seeds.

## 6. Results

### 6-1. AMS14C dating result

Previous studies have demonstrated that Chega Sofla was an important prehistoric settlement in the northern Persian Gulf region during the fifth millennium BCE and that, from the perspective of social evolution, the site flourished during the Later Village Period, a phase characterized by pronounced economic intensification in which the expansion of irrigation agriculture and the specialization of animal husbandry facilitated the accumulation of surplus, supported higher population densities, and marked a critical transition from relatively simple late Neolithic farming communities to more complex social structures (Hole, 1987; Moghaddam, 2016; Moghaddam, 2018; Moghaddam & Miri, 2021; Alirezazadeh *et al.,* 2024; Darabi *et al.,* 2024). Benefiting from the favorable irrigation conditions of the Zeydun Plain, Chega Sofla developed high-intensity cereal cultivation and established a composite subsistence strategy centered on intensive agriculture and well-developed pastoralism, supplemented by the exploitation of wild resources (Moghaddam, 2018; Dahdouh *et al.,* 2024). AMS $^{14}C$ dating of the faba bean remains recovered from the site's granary yielded a calibrated age of 6486-6387 calBP (4530-4440 BCE), providing robust scientific support for the proposed chronological framework.

### 6-2. Morphometric Analysis and Comparative Study of Faba Bean Remains

A total of 7 charred faba bean macrofossils were recovered, including 5 complete seeds (one of which was intensely charred and slightly broken) and 2 faba bean fragments (Fig. 2). Faba bean seeds possess an elongated radicle and an oblong hilum, with early domesticated types typically exhibiting wedge-shaped or ovoid morphologies with considerable variation, and a thickness that gradually tapers from the hilum toward the radicle end (Tanno & Willcox, 2006; Caracuta *et al.,* 2016). However, due to the special characteristics of faba bean such as harvest time and its own physiological characteristics, there are many limitations in the preservation of faba beans in archaeological sites; characteristics such as seed coat and hilum are difficult to preserve, and generally only the cotyledons of the seeds are preserved; the number of preserved faba bean remains is much different from that of other legumes (such as peas and chickpeas) (Tanno & Willcox, 2006; Zohary *et al.,* 2012). The charred faba beans from Chega Sofla have almost no preserved seed coat, so no trace of the hilum can be seen, but it can be seen that the seeds are basically wedge-shaped and have preserved complete radicles or radicle fragments.

Morphological measurements were performed using a stereo microscope, and the morphological index results of the five intact charred seeds were shown in Table 1, including length, breadth, thickness and the standard deviation (SD) of each index. The seed morphological characteristics

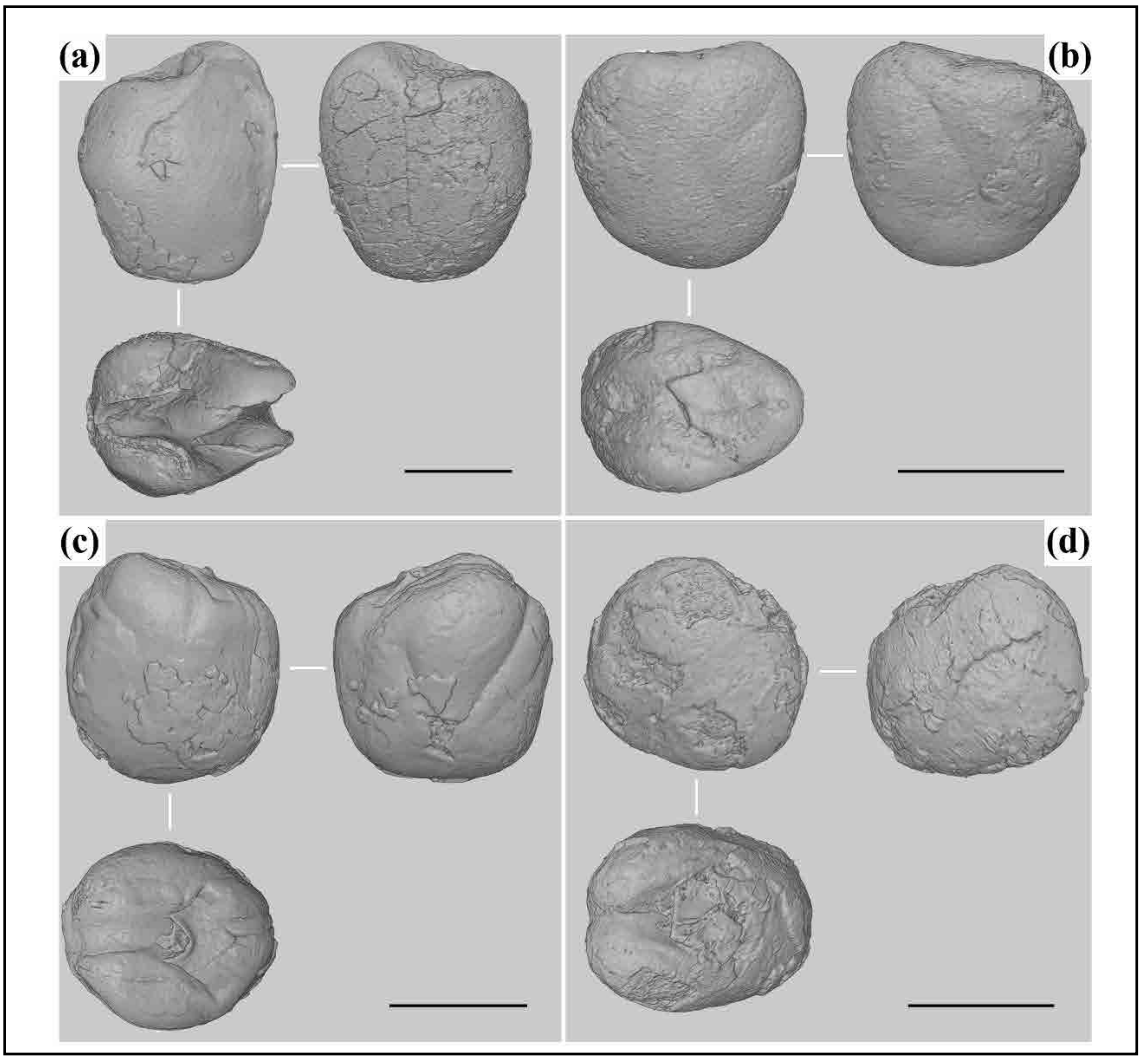



**Fig. 2: 2CT scan images of intact faba been (*Vicia faba*) remains (Scale bars in the images all represent 2mm).**

of this site were compared with those of the typical sites with faba bean macrofossils from the Pre-Pottery Neolithic to the Pottery Neolithic in Southwest Asia, including Ahihud, Nahal Zippori 3, Yiftah'el, and Tell el-Kerkh, and 8 typical sites from the Bronze Age to the Iron Age in Britain (Fig. 3) (Kislev, 1985; Tanno & Willcox, 2006; Caracuta *et al.,* 2015; Treasure & Church, 2017). It can be seen that the charred faba bean seeds from Chega Sofla are smaller in size compared to those from other sites in Fig. 3.

## 7. Conclusions

The genetic variation in ancestral faba bean types was mainly due to additive effects and maintained phenotypic consistency through stabilizing selection while modern varieties show increased dominance effects characterized by directional and asymmetric dominance reflecting human-driven directional and disruptive selection for yield and morphological traits (Suso & Cubero, 1986). Genetic studies have shown that natural migration dominated the early genetic diversity of faba bean, and human activities (such as selection for seed size) accelerated the

morphological differentiation of faba bean seeds, but did not completely sever the intraspecific gene exchange; taxonomic traits of faba bean, such as the number of leaflets per leaf, and seed thickness and length, are controlled by multiple genes (Cubero, 1974; Cubero & Suso, 1981).

Generally, the goal of human selection for domesticated crops is to increase seed size and yield per plant, and seeds are the main target of human selection; the results of principal component analysis show that the evolution of faba bean mainly occurred during the domestication process, and the flattening of faba bean seeds in the later period allowed the limited pods to accommodate larger seeds (Witcombe & Erskine, 1984; Suso & Cubero, 1986). Early faba bean seeds were small and round (such as var. minor and var. paucijuga), with a high thickness-to-length ratio (T/L>0.70); through later directional selection by humans, seeds gradually became larger and more flattened, resulting in the modern var. equina (T/L=0.26-0.70) and var. major (T/L<0.26), where var. major seeds have become large and flat by accumulating recessive genes making them suitable for human consumption, while var. equina seeds, of medium size, balance yield and adaptability, making them suitable as animal feed (Cubero, 1984; Suso & Cubero, 1986). The T/L values (Fig. 3d) of faba beans cultivated at early sites are mostly above 0.70, corresponding to small-seeded type; morphological measurements of seeds from Chega Sofla indicate that its faba beans belong to the small-seeded type, characterized by small and relatively round seeds. In contrast, some Bronze and Iron Age sites in Britain exhibit T/L values between 0.60 and 0.70, suggesting that during this period, broader cultivation of flatter seeds had begun locally.

Charred faba bean seeds from Bronze and Iron Age sites in Britain are generally larger in volume than their Neolithic counterparts from Southwest Asia, particularly in terms of mean length and thickness; these morphological differences reflect regional and temporal variations in faba bean evolution and indicate conscious human selection during the crop's cultivation and domestication processes (Fig. 3a-c). Among them, the charred faba bean seeds found in Chega Sofla are significantly smaller in size, roughly only one-sixth to one-quarter of those in other sites. The reason may be attributed to phenotypic plasticity exhibited by the species as it adapted to different climatic environments. The modern Köppen-Geiger climate classification (Peel *et al.*, 2007) categorizes the Levant sites of Ahihud, Nahal Zippori 3, Yiftah'el, and Tell el-Kerkh as Mediterranean climate zones, the British sites as temperate oceanic climate, and the southwestern Iranian region where Chega Sofla is located as tropical desert climate; the former two experience ample winter precipitation, while the latter, despite its overall low annual rainfall, receives most of its limited precipitation during winter, and the winter climate being influenced by both Mediterranean and tropical desert climates is relatively mild. Faba beans have high carbohydrate and protein contents, with approximately 48.6 g of carbohydrates and 24.5 g of protein per 100 g of dried beans; their amino acid profile surpasses that of cereals and is closer to that of animal protein, and their early maturation characteristic, typically sown in autumn or winter and harvested in spring, likely played a key role in making them an important food resource for early humans during the late winter to early spring period, filling the gap before cereal harvests and laying the foundation for subsequent systematic agricultural practices involving faba beans

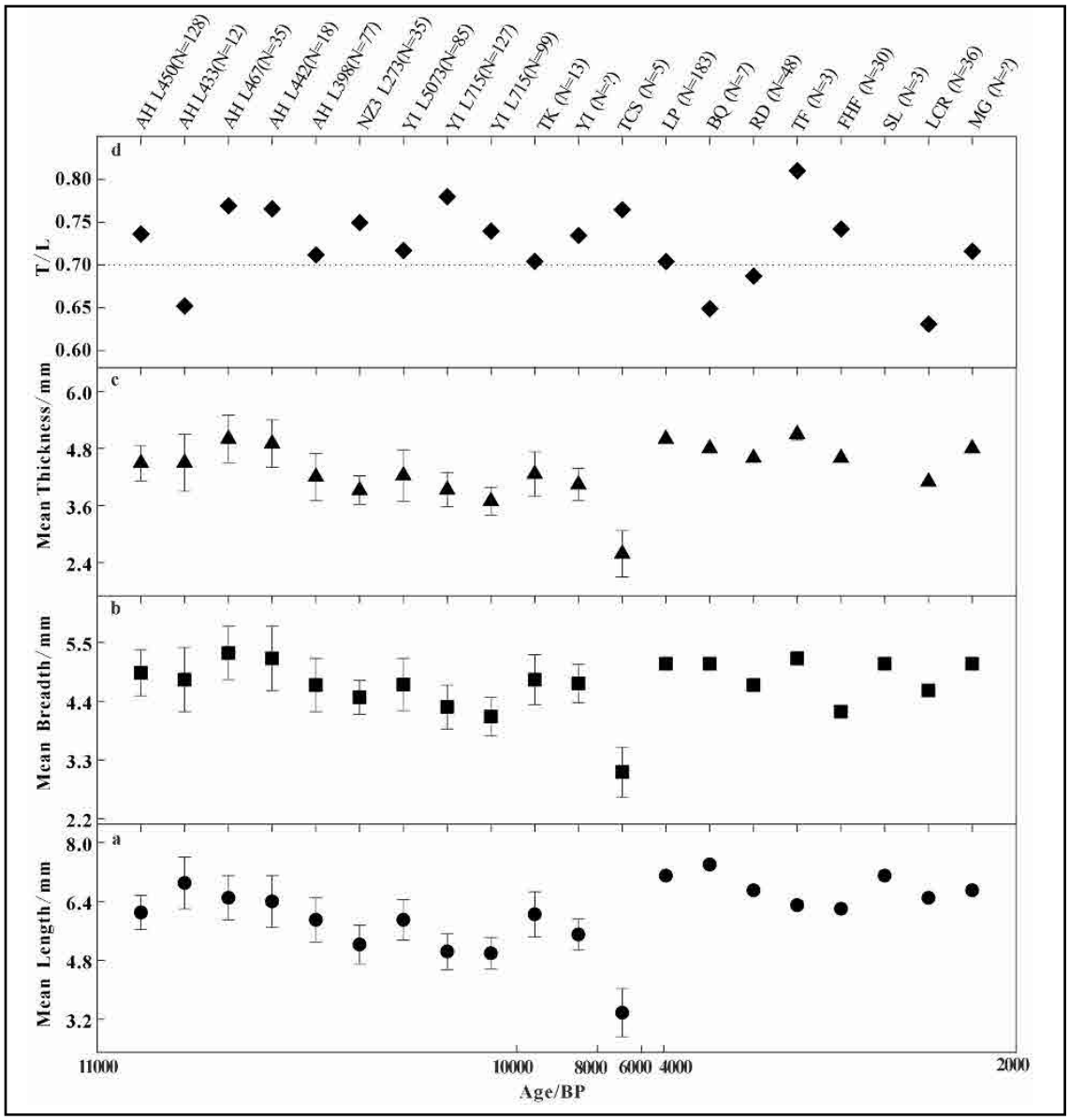



**Fig. 3: Morphological comparison of carbonized faba bean from representative Neolithic to Iron Age sites. a. Mean length comparison; b. Mean breadth comparison; c. Mean thickness comparison; d. Comparison of thickness-to-length ratio. N denotes the total number of measured faba beans; All archaeological site names are presented in abbreviated form; AH: Ahihud; NZ3: Nahal Zippori 3; YI: Yiftah'el; TK: Tell el-Kerkh; TCS: Tol-e Chega Sofla; LP: Le Pinacle; BQ: Bestwall Quarry; RD: Rowden; TF: Trethellan Farm; FHF: Frog Hall Farm; SL: Springfield Lyons; LCR: Le Câtel de Rozel; MG: Meare and Glastonbury.**

(Kislev & Bar-Yosef, 1988; Flint-Hamilton, 1999; Zong *et al.,* 2019). Modern experiments have shown that faba beans planted in autumn can have a higher yield than those planted in spring, with protecting flowers and pods from high temperatures and drought stress to enhancing seed production (Manning *et al.,* 2020; Torabian *et al.,* 2024). Currently, in Khuzestan Province, Iran, faba bean varieties that require winter sowing are commonly cultivated (Hasanvand *et al.,* 2015).

Paleoclimatic reconstructions relevant to southwestern Iran and the northern Persian Gulf during the mid-Holocene are based on multiple independent proxies, including pollen records

**Table. 1: Measurement results.**

| | Length/mm | SD | Breadth/mm | SD | Thickness/mm | SD |
|---|---|---|---|---|---|---|
| Average | 3.380 | 0.654 | 3.075 | 0.468 | 2.584 | 0.488 |
| Maximum | 4.492 | | 3.839 | | 3.319 | |
| Minimum | 2.791 | | 2.675 | | 2.061 | |

from lacustrine basins, sedimentological and geochemical data from inland lakes, and marine cores from the Persian Gulf. Pollen sequences from the Levant and western Iran indicate a generally warm early Holocene followed by increased climatic variability after ca. 7000 BP, while lake-level fluctuations and sediment records from Iran suggest shifts in precipitation seasonality rather than uniformly increased rainfall (Litt *et al.,* 2012; Jones *et al.,* 2013). Marine sediment cores from the Persian Gulf further document mid-Holocene environmental changes linked to variations in monsoon intensity and insolation, including episodes of relative cooling and increased moisture availability affecting the northern Gulf region between ca. 7000 and 6000 BP (Beni *et al.,* 2024).

Rather than invoking broad climatic contrasts between the Mediterranean and Southwest Asia, the present discussion focuses on regional-scale environmental conditions in southwestern Iran and the northern Persian Gulf zone, where Chega Sofla is located. This area represents a transitional ecological setting influenced by both Mediterranean winter precipitation systems and arid to semi-arid continental conditions. Such regional specificity is critical, as crop morphology and agricultural practices are more directly shaped by local growing-season constraints, including precipitation timing, winter temperatures, and water availability, than by macro-regional climatic categories.

Within this regional framework, the small size of the Chega Sofla faba bean seeds may reflect a combination of early domestication stage and local environmental constraints, rather than a single causal factor. Experimental and ethnographic studies demonstrate that faba bean seed size can be influenced by water stress, temperature, and sowing season, yet isolating these variables archaeologically remains difficult. Consequently, the reduced seed dimensions observed at Chega Sofla are interpreted here as a plausible adaptive response to local cultivation conditions during the Late Village Period, formulated as a working hypothesis rather than a definitive explanation.

Further evaluation of these hypotheses will require comparable, securely dated faba bean assemblages from southwestern Iran and adjacent regions, allowing environmental and domestication-related variables to be assessed independently.

Phylogenetic and archaeological evidence indicate that the faba bean originated in Southwest Asia, with its domestication likely occurring independently within the Mediterranean region (Zohary & Hopf, 1973; Kislev, 1985; Leht, 2009). Studies show that although no extant wild faba bean species have been identified, archaeobotanical evidence demonstrates that wild forms of faba bean existed long before the advent of agriculture; the wild ancestors of faba beans were exploited by local hunter-gatherer groups thousands of years prior to their formal domestication (Caracuta *et al.,* 2016). Many archaeological sites in Southwest Asia demonstrate that faba bean became a foundational legume species for human domestication as early as the initial stages of

agricultural development around 10000 years ago (Zohary *et al.,* 2012; Caracuta *et al.,* 2017; Rottenberg, 2020).

The dispersal of faba beans is hypothesized to have followed four primary routes: introduction into Europe via Anatolia; spread along the western Mediterranean coast to North Africa and the Iberian Peninsula; movement southward along the Nile River to Ethiopia; and eastward transmission through Iran into India (Cubero, 1974). The faba bean macrofossils from Chega Sofla, as archaeobotanical evidence of agricultural diversification along the southeastern margin of the Fertile Crescent, demonstrate that faba bean cultivation had reached southwestern Iran by around ca. 7000 years ago. The spread of domesticated faba beans from the Levant to this region involved extended periods of human selection and cultivation, as well as gradual adaptation to diverse ecological conditions, particularly the transition from Mediterranean to arid and semi-arid inland climates. Morphological adjustments in seed traits, coupled with the long timescales required for crop stabilization, likely contributed to the slow diffusion process, which may have spanned over a millennium, highlighting the protracted and complex dynamics of early crop dispersal.

Beyond Southwest Asia, historical and textual sources suggest that faba bean was introduced into parts of East Asia considerably later, likely through complex and multi-stage transmission routes across Central and South Asia (Zhou *et al.,* 2024). Owing to the lack of securely dated archaeobotanical evidence from these regions for the relevant periods, East Asia is not considered here as a comparative case for early domestication or morphological development. Instead, its mention serves only to underscore the long-term and geographically uneven nature of faba bean dispersal beyond its core area of early cultivation.

The charred faba bean remains from Chega Sofla constitute the earliest securely dated evidence for faba bean cultivation on the southeastern margin of the Fertile Crescent. The AMS radiocarbon date places their use in the Late Village Period (Chalcolithic), confirming that faba bean had become part of the cultivated crop repertoire in southwestern Iran by the mid–fifth millennium BCE. The recovery of these remains from a storage-related context further suggests their integration into established agricultural and subsistence strategies at the site.

Although the small number of preserved seeds limits broader generalizations, the observed small-seeded morphology is consistent with early cultivated forms documented elsewhere in Southwest Asia. These characteristics should be interpreted cautiously, as the present dataset does not allow for independent testing of environmental or evolutionary explanations. Instead, the primary significance of the Chega Sofla assemblage lies in its contribution to documenting the geographical extension of faba bean cultivation and the diversification of agricultural practices in southwestern Iran after the Late Neolithic. Future discoveries of comparable assemblages from the region will be essential for evaluating regional variability in faba bean cultivation and for clarifying the long-term trajectories of legume domestication and dispersal.

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**Authors' Contribution**

Authors contributed equally to the conceptualization and writing of the article. All of the authors approved the content of the manuscript and agreed on all aspects of the work

**Conflict of Interest**

Authors declared no conflict of interest.

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# کاشت باقلا در دورهٔ روستانشینی در چگاسفلا، جنوب‌غربی ایران: نمونه‌ای جدید از جنوب‌شرقی هلال حاصلخیزی


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**چکیده**

با وجود اهمیت باقلا (Vica faba L.) به‌عنوان یکی از کهن‌ترین لگوم‌های کشت‌شده در آسیای جنوب غربی، شواهد باستان‌گیاه‌شناسی مربوط به گسترش و کشت آن در لبهٔ جنوب‌شرقی هلال‌حاصل‌خیز همچنان محدود است. این پژوهش به معرفی و تحلیل بقایای سوخته‌شدهٔ باقلا، به‌دست آمده از چگاسفلا می‌پردازد. بقایای مذکور شامل هفت دانه (پنج دانهٔ کامل و دو شکسته) هستند که از یک فضای انبار غلات در کارگاه الف پشتهٔ شرقی محوطه و در ساختمان سوختهٔ آن به‌صورت برجا به‌دست آمده‌اند. به‌منظور تعیین گاهنگاری، یکی از دانه‌های باقلا با روش تاریخ‌گذاری رادیوکربن شتاب‌دهندهٔ (AMS14 C) مورد سنجش قرار گرفت که تاریخ کالیبره شدهٔ ۶۴۸۶-۶۳۸۷ سال پیش‌از حال حاضر را نشان می‌دهد و کشت باقلا را در این محوطه به دورهٔ روستانشینی جدید (کالکولتیک) نسبت می‌دهد. شناسایی گونه‌ای و بررسی ریخت‌سنجی دانه‌ها با استفاده از میکروسکوپ استریو و مقایسه با داده‌های منتشرشده از محوطه‌های نوسنگی و پسانوسنگی جنوب‌غرب آسیا انجام شد. نتایج نشان می‌دهد که دانه‌های باقلا در چگاسفلا از نوع کوچک‌دانه بوده و از نظر ابعاد کلی، کوچک‌تر از نمونه‌های گزارش شده از بسیاری از محوطه‌های هم‌زمان یا متأخر در مناطق مدیترانه‌ای و اروپایی است. با توجه به تعداد محدود نمونه‌ها و ماهیت زغال‌شدهٔ بقایا، این ویژگی‌های باید به‌عنوان مشاهداتی توصیفی و نه تبیینی درنظر گرفته شوند. با این‌حال، داده‌های ارائه شده شواهد مستقیمی از کشت باقلا در حاشیهٔ جنوب شرقی هلال حاصل‌خیز در هزارهٔ پنجم پیش‌ازمیلاد فراهم می‌کند و به درک بهتر از تنوع محصولات کشاورزی، راهبردهای ذخیره‌سازی و شدت‌یافتن اقتصاد کشاورزی در جنوب ایران پس از دورهٔ نوسنگی کمک می‌کند.



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