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Sensory evaluation of tea with different brewing conditions: a systematic review of recent 10-year studies

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ABSTRACT

The phytochemical profile of tea beverages under different brewing conditions should be further examined using sensory evaluation to measure preference levels, which are essential for product development. This study aims to comprehensively review the sensory profile of tea beverages with different adjustments to the brewing conditions from recent 10-year publications. This study used the methodological standards outlined in the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) across five databases (Scopus, Web of Science, ScienceDirect, ProQuest, and CABI). The Office of Health Assessment and Translation (OHAT) was used for risk bias assessment. A total of 1555 articles were identified, yielding 24 eligible studies. Various brewing conditions were identified in the study, mostly adjusted across three parameters: tea-to-water ratio, brewing temperature, and brewing duration. Preference level quantification is conducted using different hedonic scales with varying point levels, including 3-point, 5-point, 9-point, and 10-point scales. The quality assessment of tea is measured using various standards, including: Chinese national standard for sensory evaluation of tea, Check All That Apply (CATA), Percentage grading system, unstructured quantitative descriptive analysis, and degree of satisfaction difference. It could be concluded that studies about brewing condition in tea are focused on hot brewing and cold brewing with the optimum value of tea to water ration is 1:50. The sensory evaluation of tea from this different brewing condition is mainly conducted by trained panelists using 10-point hedonic scales as quantitative preference level and Chinese national standard for sensory evaluation of tea as a quality assessment method.

Keywords: brewing; preference level; sensory profile; tea

INTRODUCTION

Tea, derived from the leaves of the *Camellia sinensis* plant, stands as the second most consumed beverage globally, surpassed only by water (Valavanidis, 2019). This widespread popularity is attributed to its fascinating aroma, attractive taste, and numerous health benefits (Hilal, 2017). Approximately three billion cups of tea are consumed daily worldwide, highlighting its significant role in global beverage markets (Pan et al., 2022).

Tea varieties are primarily categorized based on their processing methods, leading to several distinct categories (Y. Zhang et al., 2016). This category determines the different types of tea, including green tea, black tea, oolong tea, dark tea, and white tea (Wong et al., 2022). Green tea is unfermented or minimally oxidized tea (Musial et al., 2020). Black tea is a fully oxidized tea (Qu et al., 2019). Oolong tea is semi-fermented or partially oxidized, falling between green and black tea in terms of processing (Ng et al., 2018). Dark tea undergoes a unique post-

fermentation process, often involving microbial fermentation (F.-J. Lin et al., 2021). White tea is made from very young leaves and buds that are subjected to very minimal processing and oxidation (Zhou et al., 2023). Different categories of tea raw material are responsible for the different phytochemical profiles of the tea beverage product (J. Li et al., 2020).

The various phytochemical profiles of tea beverages become more complex since it is not only determined based on the tea leaves processing method but also determined by the tea brewing condition (Pastoriza et al., 2017). Several studies focus on adjusted brewing parameters to improve bioactive compound and phytochemical profiles of different types of tea, including green tea (Sharpe et al., 2016), oolong tea (Cao et al., 2022), black tea (Yu et al., 2021), dark tea (S. Wang et al., 2022), and white tea (Pérez-Burillo et al., 2018). This shows that brewing condition is an essential parameter that determines the quality of the tea beverage product.

Sensory evaluation is another essential parameter that determines the tea beverage quality (Moreira et al., 2024). Several studies have revealed that sensory evaluation can become a standard measurement for tea product development with several adjustments, including: microwave drying (Karadag et al., 2016), aging time (C. He et al., 2023), re-rolling treatment (Q. Chen et al., 2024), Different Withering processes (Paiva et al., 2023), oxygen concentration in fermentation (Y. Jiang et al., 2025), Fragrance-Enhancing Temperature (B. Jiang et al., 2024), and probiotic ingredients (Tewari et al., 2018). However, there are limited studies that use sensory evaluation to assess the quality of tea under different brewing conditions. A combination of brewing condition adjustment and sensory evaluation assessment can give a robust tea quality standard.

The purpose of this study is to comprehensively review the sensory profile of tea beverages with different adjustments to the brewing conditions from a 10-year recent publication database.

METHODOLOGY

This systematic review was constructed using the methodological standards according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (Kamioka, 2019). The protocol has been adjusted to fulfil the update of the PRISMA-P checklist (Page et al., 2021).

Search Strategy

Keywords related to the tea brewing condition and sensory evaluation were used to develop the initial search strategy (Table 1). Searches were performed between November 1st and 2nd, 2025, using reputable electronic databases including: Scopus, Web of Science, Science Direct, ProQuest, and CABI. Years of publication have been set as a filter to get the most recent 10 years of records (2015 – 2025).

Eligibility Criteria

This study included original articles (research papers). It excluded all review papers (scoping review,

narrative review, and systematic review) and bibliometric studies. The pre-specified inclusion and exclusion criteria were applied for eligibility (Table 2).

Table 1.
Search strategies used for each database

Database	**Search Strategy**
Scopus	(TITLE-ABS-KEY ("Tea Beverage") OR TITLE-ABS-KEY ("Camelia sinensis") OR TITLE-ABS-KEY ("Black Tea") OR TITLE-ABS-KEY ("Green Tea") AND TITLE-ABS-KEY (Brewing) OR TITLE-ABS-KEY (Heating) OR TITLE-ABS-KEY (Infusion) OR TITLE-ABS-KEY (Water Extraction) AND TITLE-ABS-KEY ("Preference Level") OR TITLE-ABS-KEY ("Sensory Evaluation") OR TITLE-ABS-KEY ("Hedonic Score") OR TITLE-ABS-KEY ("Consumer Acceptance")) AND PUBYEAR > 2014 AND PUBYEAR < 2026
Web of Science	"Tea Beverage" (Title) OR "Camelia sinensis" (Title) OR "Black Tea" (Title) OR "Green Tea" (Title) AND "Brewing Temperature" (Title) OR "Heating Temperature" (Title) OR "Infusion Temperature" (Title) OR "Water Extraction Temperature" (Title) AND "Preference Level" (Title) OR "Sensory Evaluation" (Title) OR "Hedonic Score" (Title) OR "Consumer Acceptance" (Title)
Science Direct	"Tea Beverage" AND "Brewing" OR "Heating" OR "Infusion" AND "Preference Level" OR "Sensory Evaluation" OR "Hedonic Score"
ProQuest	title ("Tea Beverage") OR title ("Camelia sinensis") AND title ("Brewing Temperature") OR title ("Heating Temperature") OR title ("Infusion Temperature") OR title ("Water Extraction Temperature") AND title ("Preference Level") OR title ("Sensory Evaluation") OR title ("Hedonic Score") AND "Consumer Acceptance"
CABI	Title:("Tea Beverage") OR Title: ("Camelia sinensis") OR Title: ("Black Tea") OR Title: ("Green Tea ") AND Title: ("Brewing Temperature") OR Title: ("Heating Temperature") OR Title: ("Infusion Temperature") OR Title: ("Water Extraction Temperature ") AND Title: ("Preference Level") OR Title: ("Sensory Evaluation") OR Title: ("Hedonic Score ") OR Title: ("Consumer Acceptance")

Table 2.
The eligibility criteria for studies

PICO	**Inclusion**	**Exclusion**
Population	Original article using at least one of tea category product (green tea, black tea, oolong tea, dark tea, and white tea)	Study that using herbal tea product, fermented beverage like tea product and fermented food like tea product
Interventions	Studies with adjustment of brewing condition	Studies without any adjustment in the brewing condition
Controls	Studies that including control group in the sensory evaluation	Studies without a control group
Outcomes	Studies describing the effect of different brewing condition on the sensory profile of tea beverage product	Studies that do not involving sensory evaluation or any adjusted profile of tea beverage caused by the different brewing condition

Note: PICO stands for Population, Intervention, Controls, and Outcome

Data Extraction

The results of the database search were recorded and imported to the Rayyan application (Qatar Computing Research Institute, Doha, Qatar). Each suspected duplicate record could be reviewed and duplicates eliminated using Rayyan's automated capabilities(Ouzzani et al., 2016). The title and abstract of the article from

the database were read thoroughly, following the eligibility criteria (Table 2). After screening, the Full text of each screened article was uploaded to Rayyan for further analysis to decide which study is further selected for systematic review. The data extraction is conducted by giving labels about the details of sensory evaluation in different tea brewing conditions.

Bias Risk Assessment

The study used the OHAT (Office of Health Assessment and Translation) risk of bias rating tool as a risk bias assessment in this study. This tool assigns the study into four categories: definitely low risk of bias (DL), probably low risk of bias (PL), probably high risk of bias (PH), and definitely high risk of bias (DH).

The four categories of bias risk were then assigned numerical values ranging from 1 to 4, reflecting their bias levels. Value of 1 represented no bias (DL). Value of 2 represented a probable low risk of bias (PL). The value of 3 represented a probable high risk of bias. Value 4 represented a definitely high risk of bias (DH). This conversion was done to obtain a quantitative assessment based on this tool. Consequently, it was decided that the danger of bias in the articles increased with the increase of the average OHAT score (Luz et al., 2024).

RESULTS AND DISCUSSION

A total of 1555 records were obtained from 5 databases (Scopus, Web of Science, Science Direct, ProQuest, and CABI). After 224 records were removed due to duplicates, a total of 1331 records were further screened by reading the title and abstract with the application of exclusion criteria. The screening process resulted in 107 records of articles, which were further assessed by full-text reading to determine their eligibility. After applying the eligibility selection, 24 articles were selected to be included in the systematic review (Figure 1).

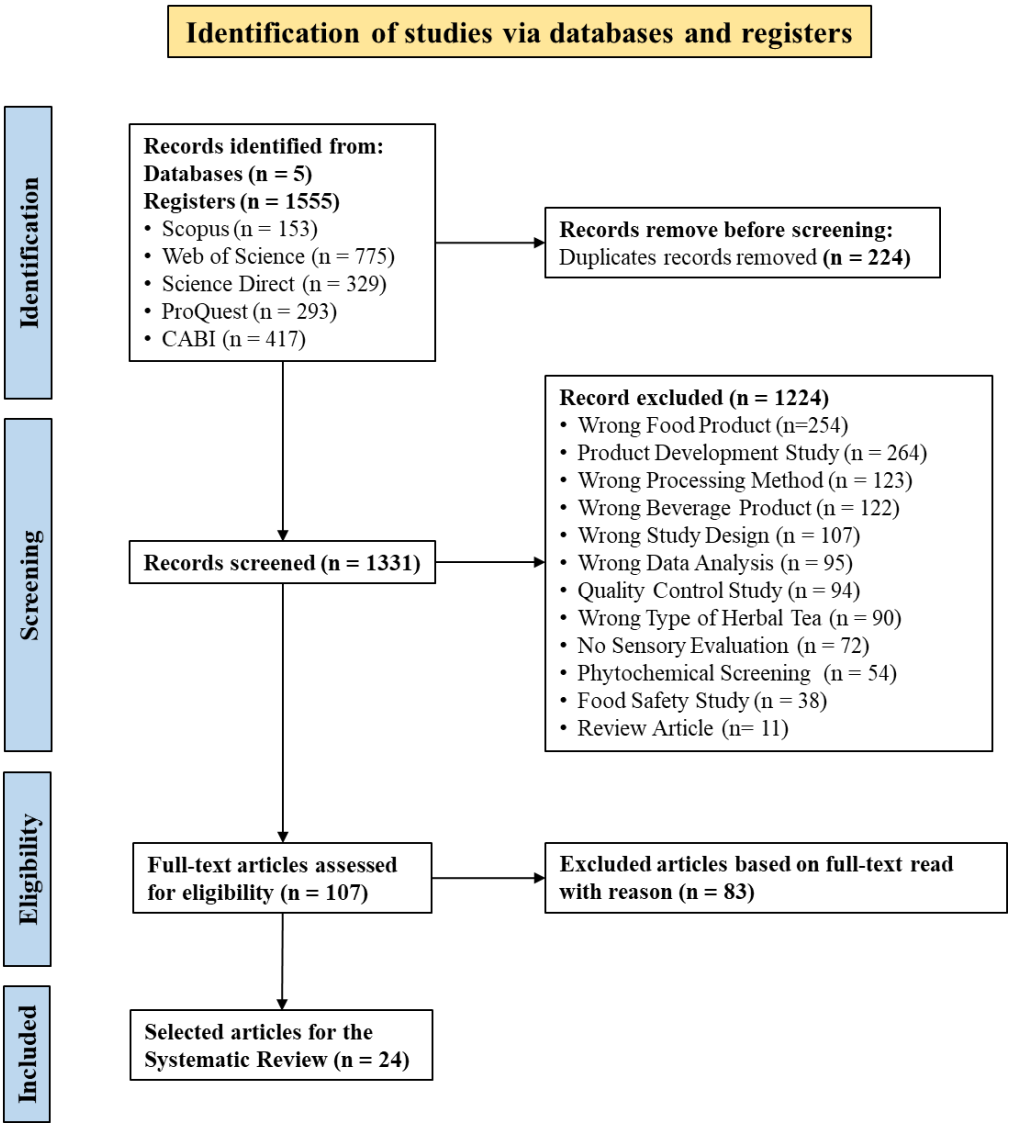

Figure 1. PRISMA flow diagram of the study selection process

Table 3.
The characteristics of the study included in the systematic review

No	Study	Type of tea	Brewing condition	Brewing Adjustment	Sensory evaluation	Additional Evaluation
1	(Gao et al., 2025)	Dark tea	• Concentration: 1:50 w/v • Temperature: 90°C • Duration: 45 min	Different brewing solvent: Sterile water, Water Kefir, Water + *E. cristatum*	10-Point hedonic scale by trained assessors	• Volatile organic compound • Organic acid and catechin
2	(Wei et al., 2024)	Green tea	• Concentration: 1:50 w/v • Temperature: 65, 75, 85, 100°C • Duration: 1, 2, 3, 4, 5, 10, 20, and 40 min	Different temperature and duration of brewing	Tea Sensory evaluation Method (GB/T23776-2018) by trained panelists	• Antioxidant activity • α-amylase and α-glucosidase inhibition
3	(Zeng et al., 2023)	Oolong tea	• Concentration: 5 g tea in 110 mL water • Temperature: 100°C	Different grade of oolong tea	10-point hedonic scale by trained panelists (hold certificates for tea quality evaluation)	• Volatile aroma compound • Non-volatile compound

			• Duration: 2, 3, and 5 min			
4	(L. Xu et al., 2025)	Green tea	• Concentration: 1:50 w/v • Temperature: 100°C (hot brewed) and 4°C (cold brewed) • Duration: 4 min (hot brewed) overnight (cold brewed)	Addition of calcium salt at different concentration (0.18, 0.37, 0.73 and 1.1 mmol/L)	• 10-point hedonic scale by volunteer • Oral processing sample by volunteer • Astringency intensity	• Particle size distribution • Turbidity • Catechin • Friction coefficient
5	(Polat et al., 2022)	Black tea	• Concentration: 1: 20 w/v • Temperature: 100°C • Duration: 5 min	Using Traditional Turkish type black tea infusion method	5-point hedonic scale by testers (untrained panelists)	• Total polyphenol content • Caffeine analysis • Theaflavin and Thearubigin analysis
6	(Y.-Q. Xu et al., 2017)	Green, Oolong, and Black Tea	• Concentration: 1:50 w/v • Temperature: 100°C • Duration: 5 min	Different type of brewing water (mineral water and tap water)	10-point hedonic scale by trained panelists (modified from traditional 9-point hedonic scale)	• Catechins & caffeine analysis • Color measurement • Antioxidant activity
7	(Y. Liu et al., 2018)	Green tea	• Concentration: 1:30, 1:40, 1:50, 1:60, and 1:70 w/v • Temperature: 60, 70, 80, and 90°C • Duration: 2.6, 5.1 and 7.6 min	Different temperature, time, water/tea ratio and particle size	10-point hedonic scale by trained panelists	• Volatile compound analysis • Total free amino acids, catechin and caffeine • Antioxidant activity • Color parameter
8	(M. Li et al., 2023)	Green tea	• Concentration: 3 g in 150 ml water • Temperature: 100°C • Duration: 5 min	Different type of drinking water for brewing process	9-point hedonic scale by Professional panelists in tea sensory evaluation	• Volatile compound • Odor activity value • Aroma character impact
9	(Yeo et al., 2024)	Black Tea	• Concentration: 14 g in 840 mL water • Temperature: 20°C • Duration: 12 h	Pulsed electric field pre-treatment with 1, 1.5, and 2 kV/cm electric field strength	9-point hedonic scale by evaluator panelist with majored in food science (trained)	• Total soluble solids • Turbidity • Theaflavin and thearubigin content
10	(Zhao et al., 2025)	Black Tea	• Concentration: 1:100, 1:50, 1:45, 1:40, 1:30, 1:25, and 1:20 w/v • Temperature: 95, 85, and 75°C • Duration: 5, 25, and 45 s	Three times infusion with different range of tea/water ratio, brewing time, and temperature	Degree of satisfaction difference and sensory evaluation survival analysis by the tea consumer	• Response surface methodology • Total dissolved solid
11	(S.-L. Liu et al., 2021)	Green, oolong, and black tea	• Concentration: 1:50 w/v • Temperature: 4 – 5°C • Duration: 6 h	Using Taiwanese specialty teas with different fermentation degree	Volunteer completed the CATA (Check all that apply) questioner for static and dynamic sensory evaluation	No additional evaluation
12	(X. Chen et al., 2020)	Black tea	• Concentration: 10g of tea in 800 ml water • Temperature: 95°C • Duration: 5 min	Simultaneous distillation extraction of tea aroma compounds while brewing	sensory evaluation of tea according to GB/T23776-2018 by trained panelists	• Tea aroma compound • Odor attribute analysis • Odor intensity and value
13	(Castiglioni et al., 2015)	Green and white tea	• Concentration: 0.5 g tea in 20 ml water	Different steeping condition in brewing (time, temperature and	5-point hedonic scale by volunteer (aged group of 23-50) with personal descriptive	• Total phenolic content • Total flavonoid content

			• Temperature: 20-25°C (cold) and 70 or 90°C (hot) • Duration: 15, 30, 60, 120 min (cold) and 7 min (hot)	particle size), hot and cold brewing method	evaluation and preference	• Antioxidant activity
14	(Guo et al., 2024)	Green, black, white, oolong, and dark tea	• Concentration: 1:50 v/w • Temperature: 100°C • Duration: 4 and 5 min	Various tea utensil (tin, glass, pottery, porcelain, and purple sand pot) for brewing	5-point hedonic scale according to the national standard of China Methods for Tea Sensory Evaluation (GB/T23776-2018) and Flavor Profile Methods (ISO 6564-1985) by trained panelists	• Total amino acids • Catechin, alkaloid and flavonoids • Quantitative infusion color
15	(A. Yang et al., 2025)	Green tea	• Concentration: 3g of tea in 150 ml water • Temperature: 85°C • Duration: 4 min	Different type of brewing water (purified water, natural water, mineral water and electrolyzed water)	9-point hedonic scale, 3-point intensity scale, Tea Vocabulary for Sensory Evaluation (GB/T 14487-2018) conducted by untrained volunteer	• Chromatic parameter • Volatile compounds analysis • Non-volatile compound analysis
16	(Murugesh et al., 2017)	Green tea	• Concentration: 1 g of tea in 200 ml water • Temperature: 95 – 100°C • Duration: 2 min	Different type of water for brewing (Tap water, soft water, reverse osmosis water, Ultra-pure water, drinking water)	Unstructured Quantitative Descriptive Analysis (QDA) scale given by trained panelists	• Total polyphenol • Estimation of catechins and theanine • Electric nose analysis • Electric tongue analysis
17	(H. Zhang et al., 2017)	White tea	• Concentration: 1:30, 1:40, 1:50 and 1:60 w/v • Temperature: 80, 90 and 100°C • Duration: 3,4,5,6, and 7 min	Different brewing condition (ratio tea and water, temperature, brewing time and number of brewing step)	Percentage grading system with sensory evaluation based on China national standard (GB/T 23776-2009) by trained panelists	• Catechins, theanine and caffeine analysis • Free amino acid analysis
18	(J. Chen et al., 2025)	Black tea	• Concentration: 5 g of tea in 150 ml water • Temperature: 100°C • Duration 5 min	Using Northern Guangdong Black Tea with different processing (plucking, withering, rolling, fermentation and drying)	10-point hedonic scale given by qualified tea experts using standard method for tea sensory evaluation (GB/T 23776-2018)	• Caffeine, theanine, and catechin analysis • Volatile compounds analysis • Calculation of the odor activity value
19	(Kowalski et al., 2019)	Green tea and black tea	• Concentration: 2 g of tea in 100 ml water • Temperature: 100°C • Duration:1, 2, 4 and 6 min	Ultrasound pre-treatment at frequency, 40 kHz for periods of 0.5, 1, 2, 3, 4 and 6 min	5-point hedonic scale and ranking test (1-7) given by professional assessor	Determination of phenolic compound, flavonoids and caffeine
20	(C. Yang et al., 2025)	Green tea	• Concentration: 1:50 w/v • Temperature: 80°C (hot brewed), 4°C (cold brewed) • Duration: 2, 4, 8, 60, 120, 180 min	Hot and cold brewing method	Perceptible evaluation with 3-point hedonic scales given by trained panelists	• Volatile compound analysis • Non-volatile compound analysis • Color quality analysis
21	(Franks et al., 2019)	Green and black tea	• Concentration: 10g of tea in 500 ml water • Temperature: 80°C (for green	Different brewing water (tap water and deionized water)	9-point hedonic scales by semi-trained panelists	• Colorimetry and turbidity • Epigallocatechin Gallate analysis

			tea), 100°C (for black tea) • Duration: 5 min			
22	(S. Zhang, Shan, et al., 2023)	Black tea	• Concentration: 3g of tea in 150 ml water • Temperature: 100°C • Duration: 5 min	Using different grade of high-quality Dianhong Congou tea	Percentage grading system given by professional tea tasters	• Electronic tongue • Chromatic difference • Total polyphenol, free amino acid, caffeine and catechin
23	(Wu et al., 2022)	Oolong tea	• Concentration: 4.5g of tea in 450 ml water • Temperature: 2-7°C • Duration: 8h	Using oolong tea with different content of γ-aminobutyric acid (GABA)	the CATA (Check all that apply) sensory evaluation design and 9-point hedonic scales given by untrained respondents	γ-aminobutyric acid (GABA) measurement
24	(H. He et al., 2025)	Green tea	• Concentration: 2g of tea in 100 ml water • Temperature: 16°C • Duration: 60 min	• Application of B-Glucosidase • Ultrasound stirring (180 rpm)	10-point hedonic scales and Chinese national standard for sensory evaluation of tea (GB/T 23776–2018) given by semi-trained panelists	• Volatile compound analysis • Odor activity value • Polyphenol, caffeine, and free amino acid analysis • Electronic tongue

Various types of tea categories were being analyzed in the included study. Several studies exclusively analyzed one type of tea category, while some studies analyzed more than 1 type of tea category. Green tea is the most popular type of tea that has been analyzed in 58% of the included studies. Furthermore, eight studies were exclusively analyzed for this type of tea product (H. He et al., 2025; M. Li et al., 2023; Y. Liu et al., 2018; Murugesh et al., 2017; Wei et al., 2024; L. Xu et al., 2025; A. Yang et al., 2025; C. Yang et al., 2025). This result supports the indication that green tea is the most popular type of tea that is widely consumed due to its health-beneficial effect (Shrivastava et al., 2018).

The ratio of tea and water for brewing is an essential factor that determines the concentration of the brewed tea. Most of the studies used a 1:50 ratio of tea to water as an ideal concentration for brewing conditions (Gao et al., 2025; Guo et al., 2024; S.-L. Liu et al., 2021; Wei et al., 2024; L. Xu et al., 2025; Y.-Q. Xu et al., 2017; C. Yang et al., 2025). This concentration is the recommended tea-to-water ratio according to the Chinese national standard, which is mostly used in sensory evaluation (Y. Lin et al., 2024).

Temperature is the most essential parameter of the brewing condition. Based on the temperature, tea brewing can be divided into cold-brewed and hot-brewed (Carloni et al., 2023). Typically, cold-brewed coffee has a much longer duration than hot-brewed coffee. This different type of brewing resulted in different characteristics of tea (Table 4). Hot brewed is more preferable than cold brewed. There were 17 studies that exclusively used hot brewed (J. Chen et al., 2025; Franks et al., 2019; Gao et al., 2025; Guo et al., 2024; Kowalski

et al., 2019; M. Li et al., 2023; Y. Liu et al., 2018; Murugesh et al., 2017; Polat et al., 2022; Wei et al., 2024; Y.-Q. Xu et al., 2017; A. Yang et al., 2025; Zeng et al., 2023; H. Zhang et al., 2017; S. Zhang, Shan, et al., 2023; Zhao et al., 2025). Meanwhile, only four studies exclusively used cold-brewed (H. He et al., 2025; S.-L. Liu et al., 2021; Wu et al., 2022; Yeo et al., 2024). Comparison of hot and cold brewed coffee was also conducted in the same sensory evaluation session by three studies (Castiglioni et al., 2015; L. Xu et al., 2025; C. Yang et al., 2025). In the case of hot brewed tea, the higher brewing temperature tends to have a higher preference level (H. Zhang et al., 2017).

Table 4.
Characteristic comparison of cold and hot brewed

Parameter	**Cold-brewed**	**Hot-brewed**
Brewing temperature	4 – 25°C	75 – 100°C
Brewing duration	5 – 60 min	8h – 12h
Color/turbidity	Less turbid	More turbid
Aroma	Flower, chestnuts, and white musk	Citrus, walnut, and alfalfa
Bitterness	More bitter taste	Less bitter taste
Astringent	Less astringent taste	More astringent taste
Smell intensity	Less strong	Stronger

Sensory evaluation of different brewing conditions of tea shows various characteristics of preference level quantification, quality assessment method, and panellists category (Figure 2). The hedonic scale is used to measure preference level quantitatively (Triandini & Wangiyana, 2022). The 10-point hedonic scales is the most scoring method that has been used in the included studies. This hedonic scale is slightly higher in proportion than the 9-point hedonic scale, which is commonly used in herbal product sensory evaluation (Aini et al., 2024; Wichchukit & O'Mahony, 2022). The Chinese national standard for sensory evaluation of tea (GB/T 14487-2018) is mostly used in the included study as the quality assessment method. This result can give supported data to highlight the position of China in the global tea market (S. Chen & Kunwar, 2025). It is also indicated that the standard for tea quality has been described traditionally in China for many years (Y. Liu et al., 2025). The capability of panellists who give preference levels is essential in the sensory evaluation (Sipos et al., 2021). Most of the included studies used trained panellists to measure the hedonic score and quality of the tea product. This result can assure the high accuracy and precision of sensory evaluation (Wangiyana et al., 2023).

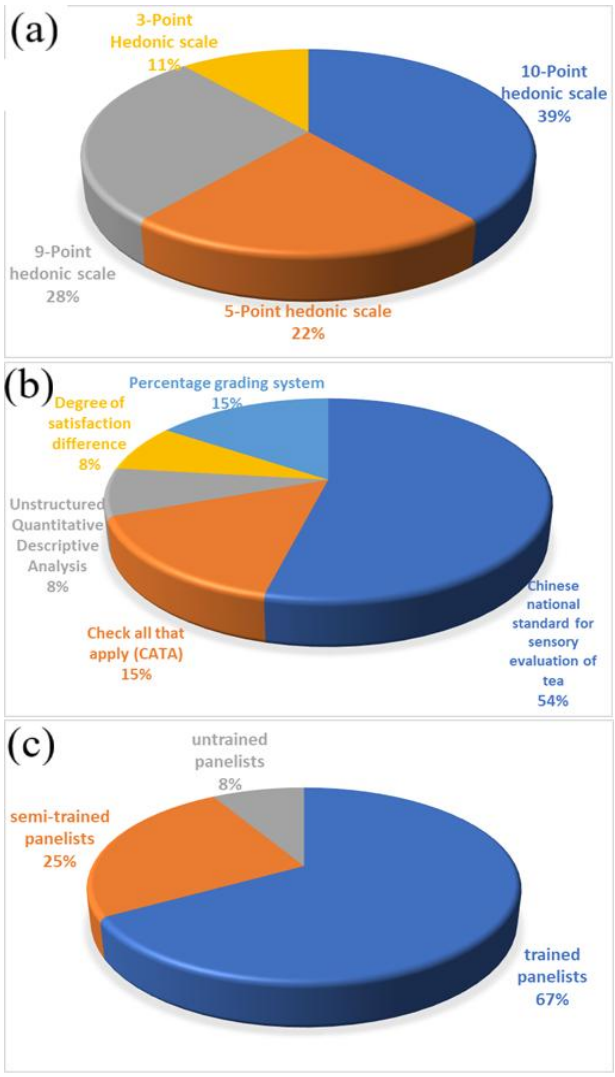

Figure 2. Sensory evaluation characteristic of the included study: (a) preference level quantification, (b) quality assessment method, (c) panelists category

Several additional evaluations were conducted in the included study. The most common evaluation is volatile compound analysis, which is related to the aroma quality of the tea product (An et al., 2022). Several compounds that typically can be found in tea beverages, such as polyphenol, caffeine, catechin, theaflavin, and thearubigin, have also been analyzed to match the correlation between phytochemical profile and sensory profile (J. Li et al., 2020; Wangiyana et al., 2025; S. Zhang, Liu, et al., 2023). Antioxidant activity measurement was also conducted in several included studies, which is a standard method to examine the capability of tea products as a beverage with health-beneficial value (W. Wang et al., 2023; Wangiyana et al., 2021; Winiarska-Mieczan & Baranowska-Wójcik, 2024). The sensory profile of tea given by panellists can be compared with machine learning sensory capability, which uses artificial intelligence (Y. Zhang et al., 2025). Several included studies in this review used machine sensory confirmation in the form of an electric nose and an electric tongue (H.

He et al., 2025; Murugesh et al., 2017). All of this analysis shows that the quality assessment of a tea product is complex and comprehensive.

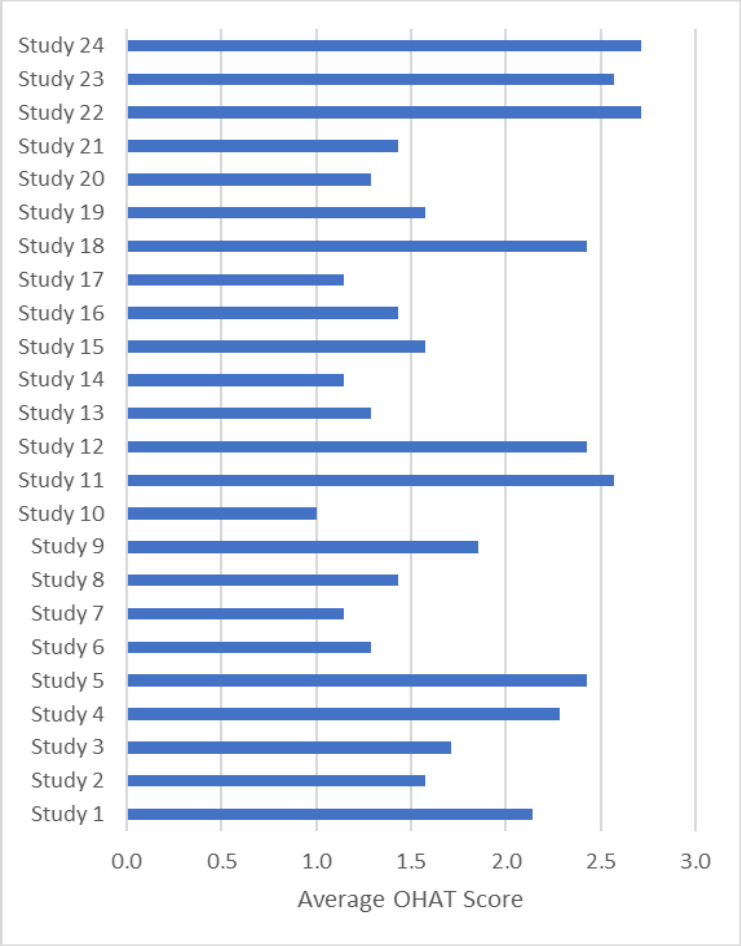

Figure 3. Bias risk assessment result using OHAT scoring

The bias risk assessment result shows that most included studies have an average OHAT score value ranging from 1 to 2 (Figure 3). This result indicates that the selected items included based on data extraction typically have a low risk of bias. The OHAT risk of bias approach can be used for sensitivity analyses in later stages of the systematic review process, openly reveals particular factors that may skew individual study results, and provides information for evaluating the overall level of confidence in the body of data (Boyles et al., 2025). Thus, the result of the OHAT shows the reliability of the included studies that have been selected and screened.

CONCLUSION

It could be concluded that in the recent ten years, studies about brewing conditions in tea have focused on hot brewing with temperatures ranging from 75-100 °C for 5 – 60 min and cold brewing with temperatures ranging from 4 – 25 °C for 8 – 12 h. There are various tea-to-water ratios that were used in the included study, with the optimum value being 1 g of tea in 50 ml of water.

The sensory evaluation of tea from this different brewing condition is mostly conducted by trained panellists using 10-point hedonic scales as a quantitative preference level and the Chinese national standard for sensory evaluation of tea as a quality assessment method.

It could be suggested that the development of tea products can use both cold brewing and hot brewing methods, depending on the targeted characteristics of the tea product. Cold brewing can be chosen to produce tea with a unique fragrance that might be lost in hot brewing. On the other hand, hot brewing can be chosen to produce a more turbid and stronger taste of the tea product.

Further research that directly compares the quantification of preference levels across different hedonic scales is essential to follow up on the findings of this study. This direct comparison can provide more concrete data on the appropriate hedonic scale for tea sensory evaluation.

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