

RESEARCH MONOGRAPH . COMPOUND PROFILE

Theacrine

A methylxanthine present in kucha tea (Camellia kucha) with caffeine-like CNS effects but reduced tolerance development.

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COMPOUND CLASS	Methylxanthine / kucha tea alkaloid

ABSTRACT

Theacrine (1,3,7,9-tetramethyluric acid; CAS 2309-49-1) is a methylxanthine alkaloid present in kucha tea (*Camellia kucha*) and yerba mate. The compound has structural similarity to caffeine but with two additional methyl groups that produce a distinct pharmacology. Theacrine acts as an adenosine receptor antagonist (similar mechanism to caffeine) but with slower onset (peak effect at 1.5 to 2 hours) and reportedly slower tolerance development. The compound is sold as TeaCrine (Compound Solutions) for performance and energy applications. Doses are typically 100 to 300 mg per administration.

1. 1. Compound Identification

Theacrine is described as methylxanthine / kucha tea alkaloid. A methylxanthine present in kucha tea (*Camellia kucha*) with caffeine-like CNS effects but reduced tolerance development.

1.1. 1.1 Class summary

Methylxanthine / kucha tea alkaloid

1.2. 1.2 Subtitle

A methylxanthine present in kucha tea (*Camellia kucha*) with caffeine-like CNS effects but reduced tolerance development.

2. 2. Abstract

Theacrine (1,3,7,9-tetramethyluric acid; CAS 2309-49-1) is a methylxanthine alkaloid present in kucha tea (*Camellia kucha*) and yerba mate. The compound has structural similarity to caffeine but with two additional methyl groups that produce a distinct pharmacology. Theacrine acts as an adenosine receptor antagonist (similar mechanism to caffeine) but with slower onset (peak effect at 1.5 to 2 hours) and reportedly slower tolerance development. The compound is sold as TeaCrine (Compound Solutions) for performance and energy applications. Doses are typically 100 to 300 mg per administration.

3. Mechanism of Action

Adenosine receptor antagonist; slower onset and reduced tolerance development relative to caffeine.

The mechanistic profile described above represents the consensus position from peer-reviewed literature where available; for compounds with sparse formal characterization, this section reflects vendor-grade reports and structurally-related class pharmacology and should be interpreted with appropriate caution.

4. 4. Pharmacokinetics and Routes of Administration

Pharmacokinetic data are summarized within the abstract for compounds with formal Phase 1 records. Compounds without published human pharmacokinetic studies are noted as such; investigators should treat the absence of data as a research limitation.

5. 5. Reported Research Dose Ranges

100 to 300 mg per administration.

Doses are scaled from clinical use where the compound is approved as a medicine, from Phase 2/3 trials where development advanced, or from rodent dose-response data scaled by allometric assumptions where the compound has no human clinical record. Investigators should treat dose ranges from research-chemical-grade vendors as starting points for their own pharmacokinetic and tolerability characterization rather than validated dosing recommendations.

6. Sourcing and Quality Verification

Investigators should obtain analytical confirmation of identity (mass spectrometry; for peptides, additionally amino acid analysis or N-terminal sequencing) and purity (HPLC area-percent, ideally greater than 95 percent) on every lot. Vendor certificates of analysis vary in quality; third-party analytical confirmation through independent laboratories (e.g., Janoshik Analytical, Anabolic Lab) is the gold standard for research-grade peptides and small molecules.

For compounds with established pharmaceutical-grade marketing in any jurisdiction, sourcing from the marketed product (where legal and accessible) provides the highest quality assurance.

7. 7. Reconstitution and Handling

Peptides should be reconstituted in bacteriostatic water or sterile water for injection in the volume appropriate to the desired concentration; lyophilized peptides should be allowed to come to room temperature before reconstitution to minimize precipitation. Reconstituted peptides should be stored refrigerated and used within the timeframe specified by the manufacturer (typically 14 to 30 days for bacteriostatic water reconstitutions, shorter for sterile water).

Small molecules: storage conditions vary by compound; consult the certificate of analysis for the specific product. Most are stable at room temperature in dry, dark conditions; oxidation-sensitive compounds (e.g., catecholamine precursors) require cool storage and protection from light.

8. 8. Stack Interaction Considerations

Investigators combining this compound with other research substances should consider receptor-level interactions (additive effects at shared targets), enzyme-level interactions (CYP-mediated drug-drug interactions where applicable), and pharmacodynamic interactions (additive sedation, additive serotonergic activity, additive hemodynamic effects).

The stack interaction section in published monographs of well-characterized compounds is necessarily incomplete for any specific combination; investigators should treat novel combinations with elevated caution and titrate gradually.

9. 9. References

1. Habowski SM, et al. The safety and efficacy of theacrine. J Int Soc Sports Nutr 2014.

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